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DIGITAL ECOSYSTEM COUNTRY ASSESSMENT (DECA)

Moldova

NOVEMBER 2022

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The report authors accept responsibility for any errors or inaccuracies in this report.

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ACRONYMS

AmCham	American Chamber of Commerce Moldova
AML	Anti-Money Laundering
AML/CFT	Anti-Money Laundering/Countering Financing of Terrorism
ANRCETI	National Regulatory Agency for Electronic Communications & Information Technology
APA	Academy of Public Administration
ATIC	Association of ICT Companies
AWS	Amazon Web Services
CALM	Congress of Local Authorities of Moldova
CAMP	Cybersecurity Alliance for Mutual Progress
CCTLD.md	Country Code Top-Level Domain (Moldova)
CDCS	USAID Country Development Cooperation Strategy
CDMA	Code-Division-Multiple Access
CEPT	European Conference of Postal and Telecommunications Administrations
CERT	Computer Emergency Readiness Team
CGAP	Consultative Group to Assist the Poor
CIDR	Critical Infrastructure Digitalization and Resilience
CISC	Citizens Information and Service Centers
CoE	Council of Europe
CSIRT	Computer Security Incident Response Team
CSO	Civil Society Organizations
CUPS	Universal Service Delivery Centers
DDOS	Distributed denial of service
DECA	Digital Ecosystem Country Assessment
DFC	Development Finance Institution
DFS	Digital Financial Services
DO	Development Objective
DOPOMOGA	Help! Platform for services for refugees
DPM	Deputy Prime Minister
e-LPA	Electronic Local Public authorities
EaP	Eastern Partnership
EGA	E-government Agency
EGDI	UN E-government Development Index
eKYC	Electronic Know Your Customer
ENISA-ISAC	Information Sharing Analysis Centers
EPI	UN E-participation Index
FSP	Financial Service Provider
FSTA	Financial Sector Transparency Activity
FTA	Future Technologies Activity
FTTX	Optical fiber technologies
G2B	Government-to-business
G2G	Government-to-government
G2P	Government-to-persons
GCI	Global Cybersecurity Index
GDPR	General Data Protection Regulation
GIS	Geographic Information System
GIZ	German development agency
GoM	Government of Moldova
GUAM	Working Group on Cyber Security (Org for Democracy and Economic Development)
ICT	Information and Communications Technology
ID	Digital Identity
IDNP	State identity number
ISM	Institute for Standardization Moldova
ISMS	Information Security Management System
ISO	International Organization for Standardization
ISP	Internet Service Provider
ITU	International Telecommunication Union
JICA	Japan International Cooperation Agency
KII	Key Informant Interview
KPI	Key Performance Indicator
LPA	Local Public Authorities
LRCM	Legal Resources Center from Moldova
MAIB	Moldovan Agroindbank
MAPS	Moldova Assessment of the Public Procurement System (World Bank)
MDL	Moldovan Leu [currency]
MEDIA-M	Media Enabling Democracy, Inclusion and Accountability
MEDIACOR	Media center/support center for refugees
MGSP	Modernization of Government Services Project
MIGF	Moldova Internet Governance Forum
MIS	Management Information Systems
MNO	Mobile Network Operator
MoE	Ministry of Economy
MoEI	Ministry of Economy and Infrastructure

MoF	Ministry of Finance
MSME	Micro-, small and medium enterprises
NBM	National Bank of Moldova
NCPDP	National Center for Personal Data Protection
NGO	Non-Governmental Organization
NIA	National Integrity Authority
NOVATECA	Global Libraries Program (Bill and Melinda Gates Foundation)
NPCP	National Programme for Child Protection
OCDS	Open contract data standard
ODIMM	Organization for the Development of Small and Medium Enterprises
OHCHR	UN Office of the High Commissioner of Human Rights
OTT	Over-the-top media services
PM	Prime Minister
POC	Point of Contact
PRC	People's Republic of China
PSP	Payment Service Provider
RRA	Regional Roaming Agreement
RSA	Regional Spectrum Agreement
SDG	Sustainable Development Goals
SID	Safer Internet Day
SIS	Information and Security Service
SME	Small and medium enterprise
SPS	Science for Peace and Security Programme (NATO)
STEM	Science, Technology, Engineering, and Mathematics
STISC	Information Technology and Cyber Security Service
TA	Technical Assistance
TVET	Technical and Vocational Training Systems
UMTS	Universal Mobile Telecommunications Service
UNCRPD	UN Convention on the Rights of Persons with Disabilities
UNCTAD	UN Conference on Trade and Development
UNDP	UN Development Programme
UNHCR	UN High Commissioner for Refugees
UTRAMS	Unified Technical Request and Mission Support
UX/UI	User experience/user interface
xDSL	Technology that enables ordinary voice-grade copper telephone wires
ZTE	Chinese technology company

EXECUTIVE SUMMARY

BACKGROUND

USAID's Digital Strategy was launched in April 2020 with the goal of supporting our partner countries through their digital transformations.[1] It aims to improve measurable development and humanitarian assistance outcomes through the responsible use of digital technology and to strengthen the openness, inclusiveness, and security of partner country digital ecosystems.

The Digital Ecosystem Country Assessment (DECA), a flagship initiative of the Digital Strategy, informs the development, design, and implementation of USAID's strategies, projects, and activities. The DECA looks at three pillars of a nation's digital ecosystem: 1) Infrastructure and Adoption; 2) Digital Society, Rights, and Governance; and, 3) Digital Economy.[2] The DECA is intended to inform ways in which USAID/Moldova programming can understand, work with, and strengthen the country's digital ecosystem. The section below outlines how DECA findings and each resulting recommendation directly support USAID/Moldova's development objectives (DOs) and maximize utility and impact. The DECA does not evaluate or suggest modifications to existing programs, but rather assesses Moldova's digital ecosystem and identifies how USAID/Moldova's future programming can build upon or strengthen that ecosystem. DECA findings and recommendations are mapped to USAID/Moldova's Results Framework. The USAID/Moldova 2020-2025 Country Development Cooperation Strategy (CDCS) includes two Development Objectives and highlights the cross-cutting priorities of out-migration and the inclusion of youth and women:[3]

USAID/Moldova Development Objectives:

1. Strengthened participatory democracy
2. Sustainable economic growth rooted in Euro-Atlantic integration

KEY FINDINGS

Over the last decade, Moldova's commitment to digital transformation has become increasingly clear and has accelerated both at the policy and implementation levels. Under the new government in August 2021, the Office of the Deputy Prime Minister for Digitalization was established—a first in the country's history. The government's agenda, with support from the international donor community, emphasizes the digitalization of government services and systems, the growth of the ICT sector, and enabling the uptake of e-commerce. In the context of Russia's war against Ukraine, supporting and strengthening elements of Moldova's digital ecosystem such as cybersecurity of critical infrastructure, citizen media literacy, and the enabling environment for IT businesses is vital.

Moldova is home to a competitive telecommunications market, affordable internet, and well-developed internet infrastructure, much of which has been achieved over the last 10 years. While Moldova boasts 100 percent 3G and 99 percent 4G coverage, the introduction of 5G services is up for debate. The government is ready and eager to begin their 5G rollout plans, however, telecom operators are hesitant due to high implementation

costs and insufficient demand. Despite strong coverage, gaps in last-mile coverage and in rural demand for internet services remain, with 60 percent of the unconnected population reporting that the high cost of devices prevents them from gaining access to the internet.[4]

Cybersecurity implementation and capacity have not kept pace with policy development. The government has steadily introduced regulatory and policy measures on cybersecurity in an effort to harmonize with EU protocols. However, there is a need for increased support when it comes to implementation, which is due in part to a fragmented cybersecurity ecosystem, a shallow cybersecurity talent pool, and gaps in government technical capacity. Financial and human resource allocation is also inadequate to the growing and changing cybersecurity needs. The government Computer Emergency Readiness Team (CERT) comprises a small team and yet serves as the focal point for all communication and reporting of cybersecurity incidents. Other government bodies such as those that sit within the General Prosecutor's Office and the Ministry of Internal Affairs address cybersecurity issues but could benefit from increased coordination.

Digital literacy is a clear policy priority and Moldova is on par with its regional counterparts when it comes to the public's general digital skill levels.[5] Numerous digital literacy initiatives are being carried out by the government, international donors, and the private sector including efforts focused on gender inclusion in ICT. However, many of these efforts are coming to a close, and the need to sustain and scale them is even more important in the context of increased internet users and use cases during the COVID-19 pandemic.

Moldova's digital government systems and services are advanced with more than 200 public services partially or fully digitalized. These efforts are mostly concentrated at the central government level in an effort to avoid the creation of decentralized, under-resourced, siloed systems. However, local governments are not equipped with the software, hardware, budgets, or skills necessary to keep pace with transformations happening at the central level. Though the central government's rollout of digital services has not been met by a similar enthusiastic uptake at the user level, the COVID-19 pandemic proved to be a powerful push factor. The government expanded its use of digital technologies for participatory e-democracy, but citizen and civil society uptake is still limited.

Moldova has a relatively open environment in terms of internet freedom but gaps persist with regard to key legislation on data protection, access to information, and the protection of children and youth from digital harms. The current regulatory framework on data protection is not General Data Protection Regulation- (GDPR) compliant and no donors are known to be working on data protection issues in a focused manner. When it comes to access to information, fees for public data continue to hinder independent journalism and civic advocacy. General trust in the media is low. Despite an upward trend in the use of social media as a primary source for news and information—especially for youth[6]— television is still among the top sources of information for Moldovans, and they tend to trust television news over social media and online news websites.[7] Some of their mistrust stems from the spread of mis- and disinformation, which increased during the COVID-19 pandemic and can be attributed in part to the proliferation of Russian propaganda in Moldova.

The ICT sector is experiencing exponential growth, but it is afflicted by an undersupply of technically skilled talent and a shortage of promising technology startups. Significant contributions to the sector's growth include government prioritization of and donor support for setting up an IT Park and technology hubs like Tekwill. However, even these initiatives are held back by a persistent skills gap as many skilled Moldovans move abroad for work. Limited capital and lack of support for startups in Moldova both limit the number of local technology companies that support digitalization and ICT sector growth.

While the National Bank of Moldova (NBM) does not have a dedicated financial inclusion unit or a strategy to improve outcomes, e-commerce is at the forefront of the government's agenda. There is a substantial gap related to financial inclusion data, including indicators that make clear how digital financial services are being adopted and used. Outdated World Bank Findex data from 2017 shows that Moldova lags behind its neighbors on most financial inclusion metrics. The data also shows a slightly inverted gender gap, with more women than men adopting financial services.[8] Barriers to the uptake and usage of digital financial services need to be unpacked through additional research. The NBM has neither a dedicated financial inclusion unit nor a strategy that articulates key objectives and metrics around financial inclusion and takes a data-driven approach to track progress toward those objectives. The underdeveloped digital financial services sector is complemented by an equally slowly growing e-commerce market. Even though the central and local government has prioritized e-commerce and put a solid legal framework in place, capacity and consumer demand gaps hold back the sector along with challenges related to logistics, the high cost of digital payments, and a scarcity of merchants selling online.

The report makes a total of 12 recommendations for how the international development community can work with and support the country's digital ecosystem. The recommendations cover topics across the three DECA pillars and include suggestions for building on the success of existing work as well as guidance for designing and carrying out new activities and initiating new partnerships. The DECA recommendations are detailed in Section 3 of the report and listed below:

1. Strengthen cybersecurity resilience by supporting the adoption of a whole-of-government approach and by building cyber hygiene capacity within SMEs and civil society
2. Promote demand-based proof of concept initiatives in support of a safe, secure, and inclusive 5G rollout
3. Enhance digital and media literacy through development of baseline research and strategic partnerships
4. Build government capacity for data protection policy implementation; build civil society capacity for holding the government accountable
5. Enhance local efforts for e-democracy through tailored trainings on the development of participatory digital tools
6. Strengthen local government capacity to integrate digital systems that increase transparency and data-driven decision-making
7. Increase awareness of digital rights protection best practices in partnership with the Internet Governance Forum
8. Coordinate with other donors to expand digital government services with a focus on supporting SME growth
9. Use innovative approaches to build, attract, and retain technical talent
10. Strengthen the technology innovation ecosystem by recruiting qualified talent and increasing the inflow of capital
11. Expand the focus on financial inclusion, especially the digital kind, by supporting research, enabling FinTechs, and digitalizing remittances
12. Strengthen e-commerce infrastructure to support growth and integration; focus on rural market development

ROADMAP FOR THE REPORT

Section 1 provides background on the DECA framework and goals.

Section 2 presents the key findings about Moldova's digital ecosystem. This section is organized into three sub-sections by DECA pillar: digital infrastructure and adoption; digital society, rights and governance; and digital economy.

Section 3 provides recommendations on how to work with and support the digital ecosystem to achieve improved development outcomes.

Navigation tip: The navigation bar in the footer throughout this report helps you move between sections. Dark blue text will indicate the current section you are in.

SECTION 1:
ABOUT THIS ASSESSMENT

USAID's Digital Strategy aims to improve USAID development and humanitarian assistance outcomes through the responsible use of digital technology and strengthen the openness, inclusiveness, and security of country digital ecosystems. The Digital Strategy and the DECA are part of USAID's holistic approach to helping achieve the Sustainable Development Goals (SDGs).[9]

As part of the Digital Strategy implementation, the DECA examines three broad areas to understand the opportunities and challenges in a country's digital ecosystem (see Figure 1):

1. Digital Infrastructure and Adoption
2. Digital Society, Rights, and Governance
3. Digital Economy

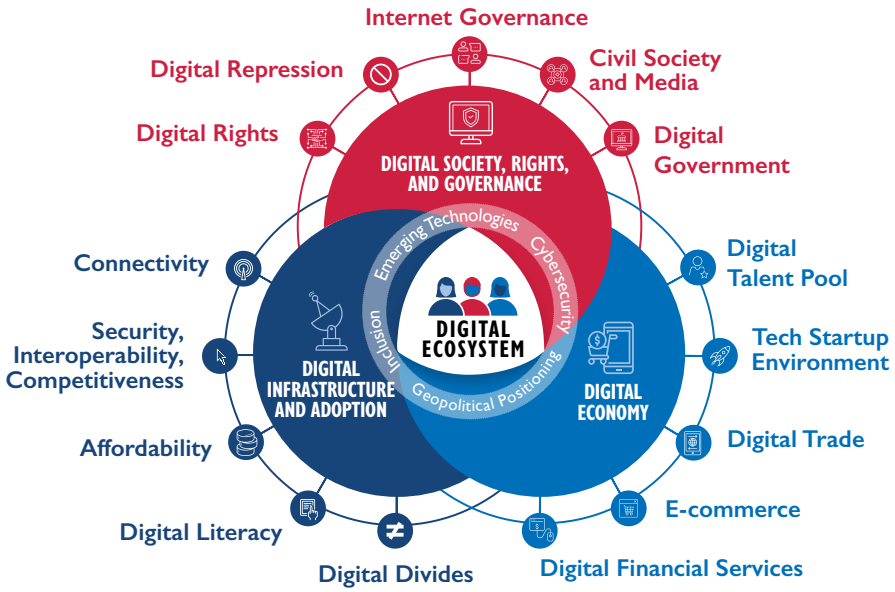
KEY TERMS | BOX 1. What is a digital ecosystem?

A digital ecosystem is comprised of stakeholders, systems, and an enabling environment that together empower people and communities to use digital technology to access services, engage with each other, and pursue economic opportunities.

The Moldova DECA took place between September 2021 and May 2022. It included desk research, consultations with USAID/Moldova, and 68 virtual key informant interviews with stakeholders from civil society, academia, the private and public sectors, international development organizations, and USAID/Moldova implementing partners conducted over an eight-week period.

The DECA is intended to be a rapid assessment of opportunities and challenges tailored to USAID/Moldova's programmatic priorities rather than an authoritative source on the country's digital ecosystem, and thus may not cover all of USAID/Moldova's program offices and projects in-depth.

FIGURE 1. USAID's Digital Ecosystem Framework



SECTION 2:
DECA FINDINGS

2.1 PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION

Digital infrastructure and adoption refers to the resources that make digital systems possible and how individuals and organizations access and use these resources. Digital infrastructure includes geographic network coverage, network performance, internet bandwidth, and spectrum allocation as well as telecom market dynamics around security, interoperability and competitiveness. This pillar also examines behavioral, social, and physical barriers and opportunities for equitable adoption (digital divides, affordability, and digital literacy[1])—who uses and does not use digital technologies and why.

DIGITAL INFRASTRUCTURE AND ADOPTION

KEY TAKEAWAYS

- Ninety-nine percent of Moldovans have access to a 4G mobile network, 76 percent use the internet, and 85 percent are unique mobile subscribers. Small gaps exist in urban-rural connectivity divides and in connecting the last-mile.
- Cybersecurity readiness is better in many private sector companies, namely ISPs and IT service providers, than among government institutions, CSOs, and the general public.
- There is high political will for the adoption of emerging technologies and for 5G rollout, but negligible demand within the private sector and society.
- Digital technology adoption by the general population is mostly for information seeking and voice telephony, less for content creation and use of services.
- The COVID-19 pandemic accelerated the general population's internet use, but simultaneously exposed key digital literacy gaps including the absence of systematic assessments of digital skills in society, government, and among SMEs.

RELEVANT RECOMMENDATIONS

- Strengthen cybersecurity resilience by supporting the adoption of a whole-of-government approach and extending cyber hygiene support to SMEs and civil society
- Promote demand-based proof of concept initiatives in support of a safe, secure, and inclusive rollout of 5G
- Enhance digital and media literacy through the development of baseline research and strategic partnerships

2.1.1 REGULATORY, LEGISLATIVE, AND POLICY CONTEXT

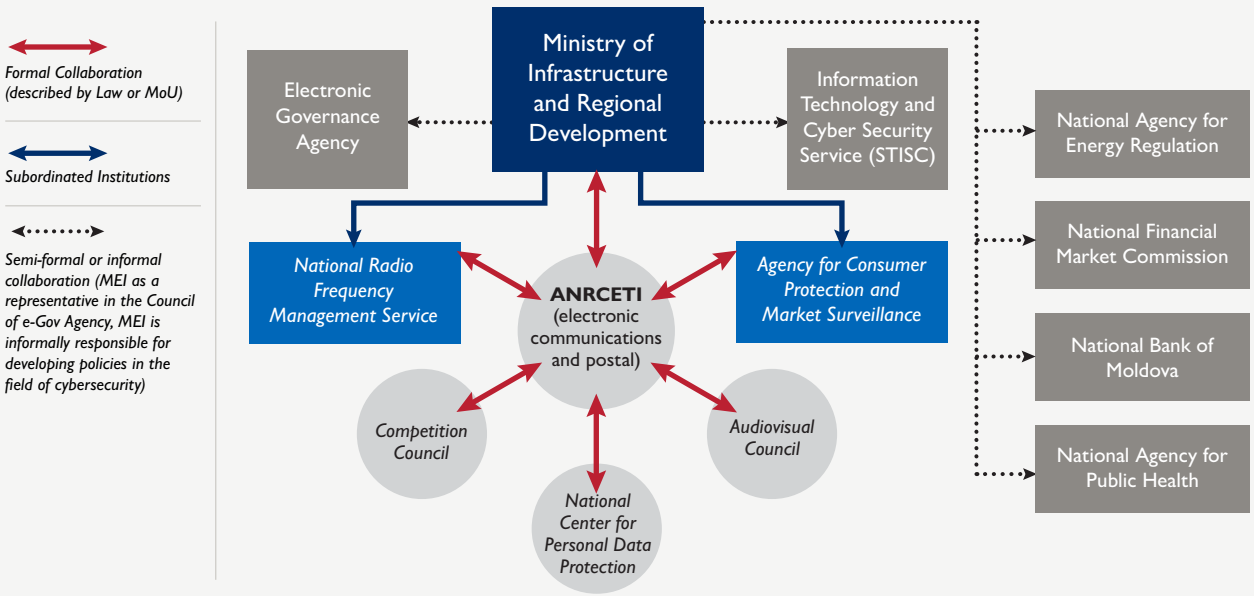
In August 2021, the new government designated a government office for digital transformation was established for the first time in the history of Moldova—the Office of the Deputy Prime Minister for Digitalization.[10] The Deputy Prime Minister (DPM) for Digitalization with the Ministry of Economy (MoE) oversees the synchronization of sectoral policies and strategies related to the technological modernization program of the Government of Moldova (GoM).[11, 12] The DPM for Digitalization also oversees the Electronic Governance Agency and the Information Technology and Cyber Security Service (STISC), important stakeholders in digital public services and cybersecurity as well as in the maintenance and development of IT and communications infrastructure of public administration authorities.[13, 14] Access to key state

1 Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic and social life. This may include competencies variously referred to as computer literacy, information and communication technology literacy, information literacy, and media literacy. See more in the USAID Digital Literacy Primer. "Digital Literacy Primer | U.S. Agency for International Development." 2022. USAID. https://www.usaid.gov/digital-development/digital-literacy-primer.

registers for electronic services such as MPay, cadaster, registration of legal entities, or the national population register (ID cards, registration of life events) is managed by the Public Services Agency while the Ministry of Infrastructure and Regional Development is responsible for national communication infrastructure.[15, 16] The latter includes access to public electronic communications networks and services; development of enablers for the formation of digital society and digital services; increased accessibility to fixed, mobile, high speed internet; and increased access to digital terrestrial TV and radio communications services.

The National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI) is the key regulator.[17] Established in 2000, ANRCETI regulates and monitors the sector's compliance with relevant laws and regulations, relations among operators, access to infrastructure, and relations between subscribers and operators. Its role is to create better conditions for IT infrastructure. ANRCETI has its own budget and is operationally independent from electronic communications and postal communications providers; its director is appointed by the government. Figure 2 below shows other related institutions and their inter-linkages.

FIGURE 2. Institutional framework for ICT regulation in Moldova



Source: ITU (May 2021) Collaborative Regulation Case Study Republic of Moldova.

Note: In August 2021, the Ministry of Economy and Infrastructure was restructured into the Ministry of Economy and the Ministry of Infrastructure and Regional Development

KEY TERMS | BOX 2. Digitization, digitalization, and digital transformation

Digitization: the conversion of data and documents from an analog format to an electronic format.

Digitalization: the use of digital technologies to improve or transform a process or interaction, often increasing productivity and efficiency.

Digital Transformation: a largescale, organization level, profound change in multiple work processes and in organizational culture brought about by leveraging digital technologies.

ACCELERATING DIGITAL TRANSFORMATION IS HIGH ON THE CURRENT GOVERNMENT'S AGENDA

Over the past decade, Moldova's commitment to digital transformation accelerated at both the policy and implementation levels. However, frequent changes in government prevent the necessary longer term continuity of policies and undermine their ability to come to full fruition. With the appointment of a DPM for Digitalization, the current GoM is sending a clear signal about the high prioritization of the sector.[18] As outlined below, key sub-sectoral policy directions are well in place. Yet, policy and legislative gaps such as comprehensive legislation and strategy on cybersecurity and anticipatory legislation and policies for the rollout of emerging technologies are outstanding. Plans for 5G rollout are encompassed conceptually in the new Radio Spectrum Management Programme (2021-2025). While political will is high for 5G in Moldova, several stakeholders noted that the legislative framework is still in process. Effective monitoring instruments for assessing the implementation status of planned actions as well as the economic and societal impact that will allow for agile, relevant policy adjustments also still need to be elaborated. There may be room to tie these different elements together in the sectoral strategy that is being drafted by the DPM for Digitalization and supported by donors,

The Roadmap for Boosting the Digitization of the National Economy and the Development of E-commerce,[19] prepared by the Economic Council to the Prime Minister,[20] was supported by the Ministry of Economy in July 2020 and was set to be updated in July 2021. Implementation was consolidated by the first Digitalisation Legislative Package, which was adopted by the Parliament of Moldova in November 2021. The series of 29 legislative initiatives seek to expand digitalization of the Moldovan economy and e-commerce and to enhance its resilience during post-COVID-19 pandemic recovery. Planned measures in the Roadmap include the expansion of electronic services and incentives for legal entities, SMEs, and the diaspora.[21] This entails wider use of the electronic signature (and unilateral recognition of EU digital signatures in Moldova), electronic power of attorney, online registration and liquidation of businesses, enhanced e-procurement procedures, remote management of employment contracts, and enhanced electronic exchange of documents between local authorities and central government (Public Services Agency). The next digitalisation legislative packages on e-commerce are being publicly discussed and additional studies on e-commerce infrastructure development are being carried out with the support of donors.

The National Development Strategy—Moldova 2030 was drafted by the former (pre-August 2019) Government and aligned with the EU Association Agreement and the UN's 2030 Agenda for Sustainable Development.[22] It focused on four policy priorities: 1) sustainable and inclusive economy; 2) strong human and social capital; 3) fair and efficient institutions; and 4) healthy environment. Although digitalization was not recognized as a focal pillar with specific key performance indicators (KPIs), ICTs were mentioned as a key cross-cutting sectoral enabler for Moldova's development. The Strategy has remained in draft form since 2019; it has not been formally adopted.

The Spectrum Management Program 2021-2025[23] is a successor to the Spectrum Management Program (2013-2020) developed in 2020 by the Ministry of Economy and Infrastructure.[II] The Program provides radio spectrum resources and determines pricing for terrestrial mobile broadband electronic communications networks. It ensures compliance of Moldova's frequency bands with ITU and EU radio regulations, in preparation for 5G implementation. The targeted bands for the auctions planned to take place from 2021 to 2025 are 700 MHz, 3600 MHz, 26 GHz, and 1500 MHz (L band) and 2300MHz. The ITU's Regional Office for Europe and the Korean Information Society Development Institute supported the Program's development.

The National Strategy for Development of the Information Society—Digital Moldova 2020, prioritized the expansion of ICT infrastructure and connectivity with nondiscriminatory access for all Moldovans with the following KPIs: 1) equipping localities and city halls with at least 30 Mbps (at one fiber optic network); 2) implementing a minimum speed in connected localities of 30 Mbps by 2020; 3) providing access to broadband internet to at least 60 percent of households; 4) providing mobile broadband access to 85 percent of localities; 5) providing access to infrastructure for electronic communications networks for 100 percent of new civilian buildings; 6) locating 80 percent of new networks in urban areas underground; 7) providing access to digital terrestrial television for 100 percent of the population. According to interviewees, implementation of this Strategy was strong, partially due to stakeholder will and partially due to the natural evolution of the market.[24] The successor policy of Digital Moldova 2020 is in the making and expected to be finalized in 2022.

MOLDOVA COLLABORATES WITH EASTERN PARTNERSHIP (EAP) COUNTRIES[III] TO ESTABLISH A COMMON ROAMING SPACE

The Regional Roaming Agreement (RRA)[25] and the Regional Spectrum Agreement (RSA)[26] are important steps for achieving regional harmonization of telecommunications. To establish a common roaming space between the six Eastern Partnership (EaP) countries, the GoM has been working with the European Commission (EU4Digital) on formal national approval procedures and in discussions about RRA.[27] It is expected that all EaP countries willing to join a common roaming space will sign the RRA and finalize approval procedures in due course. The EaP approval process has been put on hold due to the regional security crisis and Russia's war on Ukraine. In the meantime, on February 11, 2022, Moldova signed an Agreement with Romania on reducing roaming tariffs.[28] Moldova's policies in spectrum management are well aligned and synchronized with the EU through the European Conference of Postal and Telecommunications Administrations (CEPT) platform.[29]

EXISTING REGULATORY DEVELOPMENTS AND POLICY GAPS

With the rapid advancement of ICT, agile regulatory and policy responsiveness is becoming more challenging yet all the more essential. Interviewees identified several policy gaps. Law 28/2016 on Access to Properties and Shared Use of Infrastructure Associated with Public Electronic Communications Networks is considered insufficient, although no specific points for improvement were provided.[30] Discussion between the Ministry of Infrastructure and Regional Development and ANRCETI about the scope of comprehensive infrastructure mapping (in line with the Construction Code) and the mapping of national network infrastructure, public and private digital assets is ongoing.[31]

Preparatory work for the wider adoption and rollout of 5G is also being discussed by the GoM and telecom operators. Other gaps identified by interviewees include the inadequacy of equipment, software, and technical maturity of the

II Under Prime Minister Gavrilita's government (since August 2021), the former Ministry of Economy and Infrastructure was split into the Ministry of Economy and the Ministry of Infrastructure and Regional Development.

III In addition to Moldova, EaP countries include: Armenia, Azerbaijan, Belarus, Georgia and Ukraine.

next generation of digital TV (terrestrial digital broadcasting) as well as the quality of mobile provider networks. The procedure for obtaining certificates and permits is viewed as cumbersome and bureaucratic.[32]

2.1.2 COMPETITIVENESS OF THE TELECOMMUNICATIONS SECTOR

CONNECTIVITY MARKET HAS LOW BARRIERS TO ENTRY BUT THREE PLAYERS DOMINATE THE MOBILE MARKET

The ITU recognizes Moldova's telecommunication market as dynamic and competitive, characterized by high internet access speeds, good mobile services accessibility, and robust nationwide infrastructure.[33] The connectivity market has low barriers to entry with more than 100 mostly regional internet service providers (ISPs). In 2020, the fixed broadband internet market was covered by three operators. The largest share of the market belongs to Moldtelecom with 61 percent, followed by Starnet Solutions with 21 percent, and Orange Moldova with 7.5 percent.[34] The mobile broadband market is dominated by three operators: Orange Moldova with 62 percent, Moldcell with 30 percent, and Moldtelecom with 8 percent of the market. In Moldova's unrecognized breakaway region of Transnistria, Interdnestrcom, branded as IDC, is the only operating telecommunications company and mobile carrier.[35]

BOX 1. Background on Transnistria, the breakaway region of Moldova

Transnistria has aspired to independence since a brief military conflict in 1992, although it continues to be internationally recognized as a part of Moldova. Its government and economy are heavily dependent on subsidies from Russia, which maintains a military presence in the territory. Political competition is limited, and the dominant party is aligned with powerful local business interests. Impartiality and pluralism of opinion in the media is very limited, and authorities closely control civil society activity. Some observers fear that Transnistria could be pulled into the conflict.

Source: Freedom House - Freedom in the World 2022 Report, CNN 2022

ALL OPERATOR LICENSES IN MOLDOVA ARE ISSUED ON THE PRINCIPLE OF TECHNOLOGICAL NEUTRALITY

Licensing on the basis of technological neutrality is considered a good practice for enhancing market competitiveness and ultimately for providing better options to consumers.[IV] (Licenses for spectrum bands are not exclusive to certain technologies.) The practice is widely used in the EU and in North America as it enables operators the flexible use of subsequent Third Generation Partnership Project (3GPP) standards within licensed frequency bands.[36] In practice, this gives operators flexibility to replace older equipment such as moving from 3G to 4G or from 4G soon to 5G in a particular frequency band and to do so at a pace driven by market demand.[37]

EVOLUTION OF THE TELECOM MARKET: REVENUES STAGNATING BUT RISE THROUGH INCREASED USE OF DIGITAL TOP-UPS AND E-COMMERCE

The fixed-line and mobile broadband sectors in Moldova have experienced years of solid growth, but between 2016 and 2019 the sector stagnated and even declined in revenues.[38, 39] This can be largely attributed to high emigration flows and increased unemployment,[40] but also to changes in consumer behavior and migration to over-the-top media

IV Technological neutrality means licensing for spectrum bands are not limited in use to certain technologies. For example, the 790 MHz band was previously only issued for terrestrial television broadcasting.

services (OTT).[V] Increased use of OTT services can lead to reduced revenues because data use is less expensive than with fixed or mobile voice services. In 2019, the market for fixed-broadband internet services in Moldova increased significantly, with the volume of sales rising by 6 percent to reach MDL 1.16 billion (USD 63.4 million), at a time when about 16 percent of the population had a fixed broadband subscription, up from 13 percent in 2018.[41] According to ANRCETI, data obtained from the 96 fixed broadband service providers shows that the increase of sales in this market segment was determined by the increase in the number of subscribers connected via optical fiber technologies (FTTx), which increased by 11 percent, reaching 436,400 (some 67 percent of the total number of subscribers).[42] According to Moldcell, other sources of new revenue include digital topups and an increase in e-commerce, especially during the COVID-19 pandemic.[43]

GOVERNMENT, REGULATORS, AND OPERATORS HAVE OPEN DIALOGUE BUT BUSINESS-FRIENDLY POLICIES COULD IMPROVE

Operators who were interviewed did not voice significant concerns about market (non)competitive dynamics. Neither did the national regulator, ANRCETI. However, operators did request that the government foster a more business-friendly legislative and policy environment. The operators also noted that the regulator does not advocate in an unbiased way on their behalf as its leadership is appointed by the government; specifics were not provided during interviews. A strong appeal was made by operators for extending the licensing periods from 15 to 25 years as is the case in some EU countries. According to ANRCETI, local public authorities (LPA) are among those who oppose the changes to the status quo access to properties and shared use of infrastructure associated with public electronic communications networks since their budgets benefit from the presence of the operators in their localities.[44] Operators noted that it is increasingly difficult to maintain a high quality of services and to develop new competitive products as consumers are increasingly more demanding—expecting faster, more reliable and stable internet.

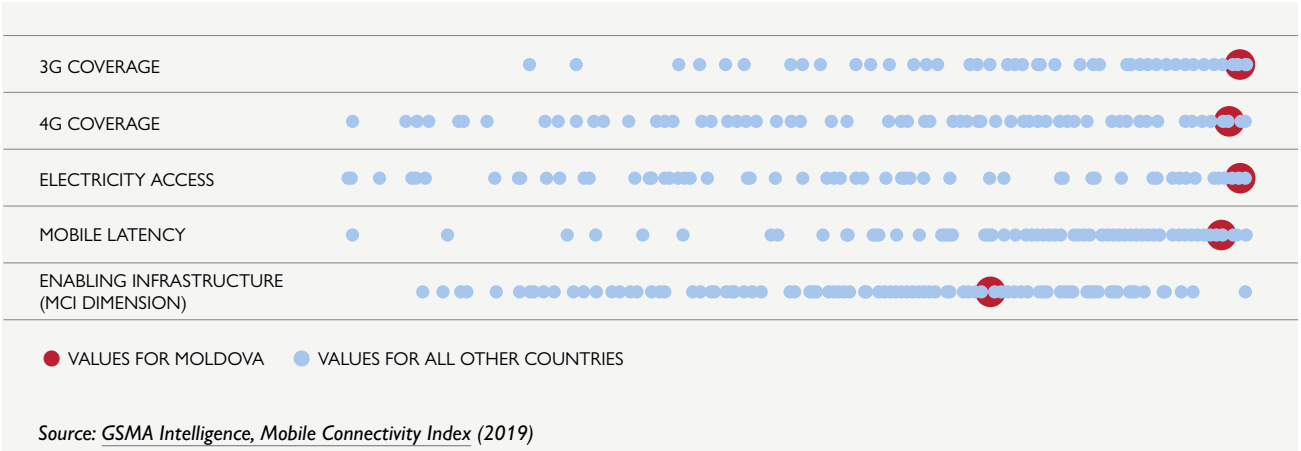
Investment in last-mile connectivity and fiber optic cables to households is costly. Rising emigration rates have a significant impact on the already small local telecom market. Sales of prepaid cards were negatively affected as the diaspora that left Moldova during the COVID-19 pandemic has remained abroad. and user preferences have changed (increased use of OTT). PRC-based *Huawei* has a significant presence in the local retail market through its provision of low cost telecom devices.

2.1.3 STRONG CONNECTIVITY INFRASTRUCTURE

Over the past decade, Moldova has significantly improved its digital infrastructure. Moldova's cities and communities are connected to the fiber optic network countrywide with 100 percent 3G coverage and 99 percent 4G coverage, which is high in the context of world rankings (Figure 3). The number of fiber connections increased by 15 percent in 2020, presumably because more people required internet at home during the COVID-19 pandemic.[45]

V Over-the-top (OTT) refers to any streaming service that delivers content over the internet directly to the end user. Bypassing cable, broadcast and satellite TV platforms the service is delivered over-the-top of another platform.

FIGURE 3. Key connectivity indicators[VI]



Source: GSMA Intelligence, Mobile Connectivity Index (2019)

DEMAND FOR MOBILE BROADBAND HAS INCREASED BUT URBAN-RURAL DIVIDE REMAINS

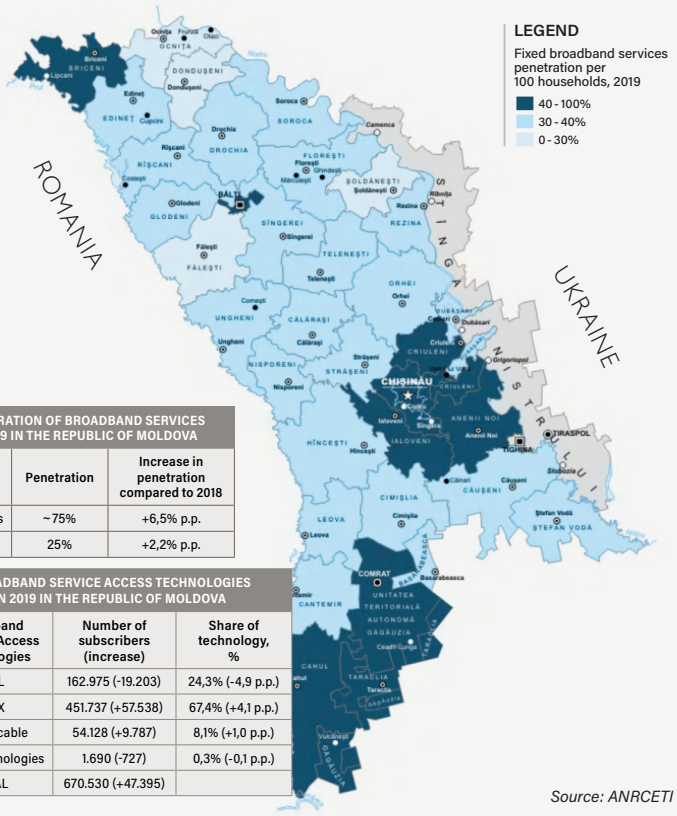
Since 2019, mobile broadband demand has increased. Sixty-five percent of Moldovan households have internet access at home and 61 percent own at least one personal computer.[46] At the end of 2020, mobile broadband subscriptions—calculated as active mobile broadband subscriptions per 100 inhabitants—reached nearly 90 percent according to ANRCETI.[47] This is not the unique subscribership; individuals may have more than one SIM card, which may inflate this number.

In August 2021, Moldova's fixed broadband speed capacity was 139.6 mbps (compared to 199 mbps in the U.S.), while mobile broadband speed capacity was 40.6 mbps (compared to 96 mbps in the U.S.). Due to the impact of the COVID-19 pandemic, the traffic generated by mobile broadband users through smartphones increased by 47 percent in 2019 to reach about 52,452 users and followed the same trend in 2020, when it increased by 55 percent and reached 81,450 users.[48] At the same time, fiber optic connections are higher in Chișinău and other major cities, while xDSL technology is more common in smaller towns and rural areas.[49]

Mobile broadband coverage is high, and yet the rural-urban connectivity divide persists. Fifty-six percent of Moldova's rural population has internet access at home (fixed or mobile broadband) compared to access among 77 percent of the urban population.[50] Connecting the unconnected and underserved to the country's broadband core networks is essential to ensure that no one is left behind and for accelerating Moldova's digital transformation efforts. Favorable conditions for last-mile connectivity—connectivity between the main backbone, network and users—are not yet in place.

VI The red circles indicate values for Moldova, while the translucent blue circles indicate values for all other countries; the gray shaded region indicates the middle 50 percent of countries.

FIGURE 4. Urban-rural access to internet (2019)



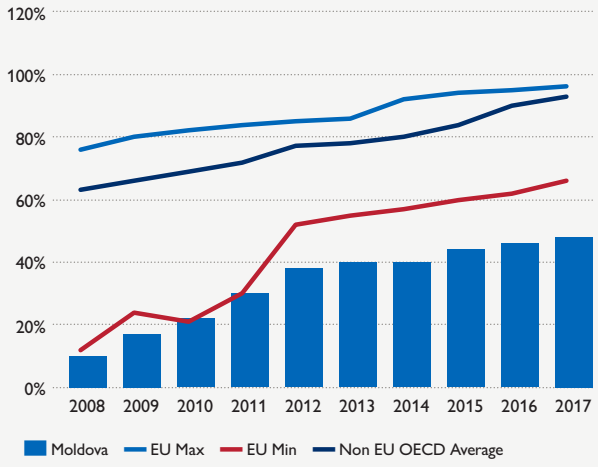
PENETRATION OF BROADBAND SERVICES IN 2019 IN THE REPUBLIC OF MOLDOVA		
Per 100	Penetration	Increase in penetration compared to 2018
Households	~75%	+6,5% p.p.
Residents	25%	+2,2% p.p.

BROADBAND SERVICE ACCESS TECHNOLOGIES IN 2019 IN THE REPUBLIC OF MOLDOVA		
Broadband Services Access Technologies	Number of subscribers (increase)	Share of technology, %
xDSL	162.975 (-19.203)	24,3% (-4,9 p.p.)
FTTX	451.737 (+57.538)	67,4% (+4,1 p.p.)
Coaxial cable	54.128 (+9.787)	8,1% (+1,0 p.p.)
Other technologies	1.690 (-727)	0,3% (-0,1 p.p.)
TOTAL	670.530 (+47.395)	

Source: ANRCETI

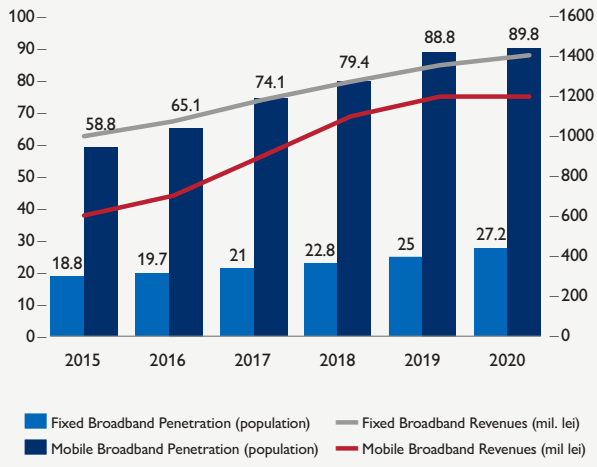
According to ANRCETI, only 100 out of 1,500 localities in Moldova, all in small rural areas, have limited network coverage due to difficult terrain, remoteness, and a small number of active users (Figure 4). Connecting these areas is costly and logistically complex. MoldTelecom (a state-owned company) received licensing rights to invest in Code-Division-Multiple-Access- (CDMA) in these areas.[VII] CDMA is used in limited areas where fixed telephone lines are underdeveloped.[51] Progress updates were not provided. Sustainable last-mile connectivity solutions require a mix of balanced regulatory, revenue, and usage models. Figure 5 below is a useful illustration of the network connectivity value chain from the national backbone network (core) to last-mile connectivity to the end user. In Moldova, while the national backbone and middle-mile networks are well connected and functioning, the last leg of the value chain lags behind.

FIGURE 5. Building a network



Source: TeleGeography GlobalComms data

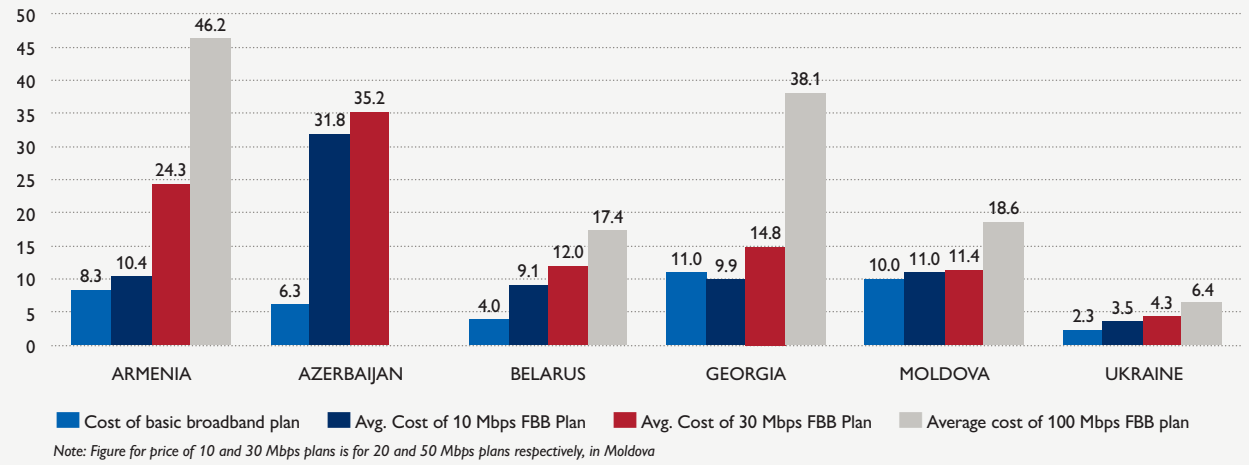
FIGURE 6. Revenues and penetration rates of fixed and mobile broadband



Source: ANRCETI

VII CDMA is a mechanism that allows several transmitters to send information simultaneously over a single communication channel, thus allowing several users to share a band of frequencies.

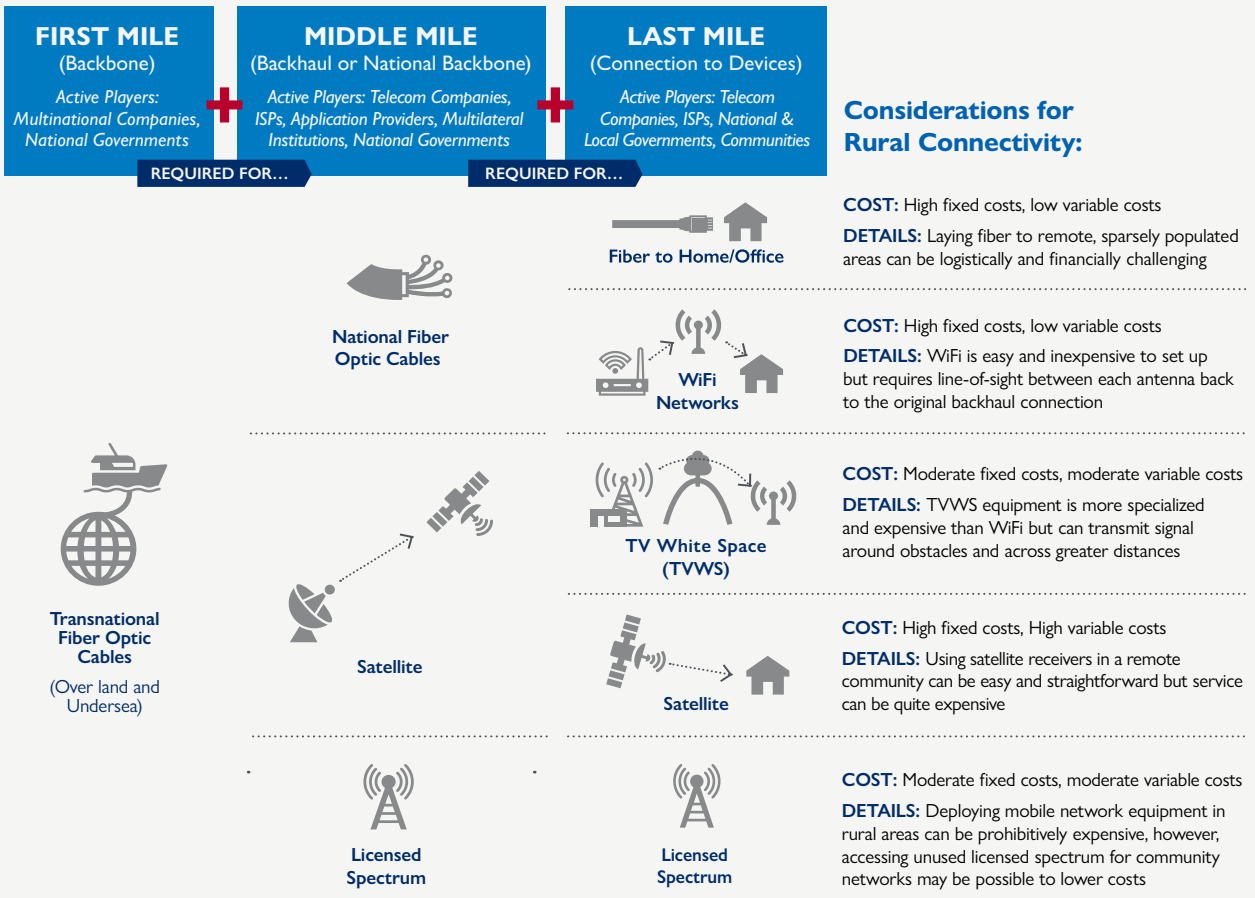
FIGURE 7. Retail of fixed broadband plans in EaP Countries (USD)



Note: Figure for price of 10 and 30 Mbps plans is for 20 and 50 Mbps plans respectively, in Moldova

Source: World Bank Group, 2018

FIGURE 8. Telecommunications network parts supporting last-mile interventions



Source: ITU (2020) The Last-mile Internet Connectivity Solutions Guide[52]

2.1.4 AFFORDABLE AND COMPETITIVELY PRICED INTERNET

Ensuring a competitive environment in the telecommunication and ICT sector is essential for digital transformation of the society. Healthy competition leads to more affordable internet access and fosters higher quality products and services for the end consumer. Moldova's internet connectivity has been lauded as competitively priced. From 2019 to 2020, affordability of internet access improved significantly in Moldova—notably for mobile data which improved by more than 60 percent. This is due in large part to increased competition. From 2019 to 2021, the two major competitors to Moldtelecom—StarNet and Orange—made large investments in their fiber optic networks, including in the last-mile and regions outside of Chisinau. In 2020, Moldova's ICT Price Basket of mobile broadband was 0.48 as a percent of GNI per capita, while for fixed broadband it was 2.25.[53] In 2020, Moldova was among the countries that met the Broadband Commission for Sustainable Development's two percent affordability target for its data-only mobile broadband basket.[VIII] Moldova also features among the countries with more than a 50 percent drop in entry-level fixed-broadband internet prices.[54] Among the population that is not connected to the internet, 60 percent report that the high cost of devices prevents them from acquiring access to the internet.[55]

2.1.5 PRIVATE SECTOR DISPLAYS LUKEWARM INTEREST IN 5G ROLLOUT DUE TO LOW MARKET DEMAND

Discussions between the government and telecommunications operators on the launch of 5G have been underway for several years. According to interviews, the GoM plans to begin selling 5G licensing rights to telecom operators in 2022 with implementation between 2023 and 2025. This timeline may be postponed as operators continue to express their low interest in proposed resources following disappointing spectrum auctions in the region (for example, in Romania).[56] Interviewees shared mixed perspectives on the implementation of 5G technology in Moldova. While the GoM—namely the Ministry of Economy, Ministry of Infrastructure and Regional Development and the National Radio Frequency Management Service—greatly favor 5G rollout, the three telecom operators interviewed (Orange, MoldCell, and Starnet) said that the rollout of 5G is premature for the Moldovan market.[57, 58] High implementation costs, insufficient demand for 5G, and the well-functioning, sufficient yet still underutilized 4G infrastructure were listed as the key reasons for this view. Low adoption and poor connection to or integration of MSignature (into which the private sector invested heavily) in different services was provided as one example. The low intensity of initiatives involving emerging technologies (AI, big data, Internet of Things, biotechnology, etc.) is another.

VIII ITU (February 2021) The affordability of ICT services 2020: Policy Brief, p.3. https://www.itu.int/en/ITU-D/Statistics/Documents/publications/prices2020/ITU_A4AI_Price_Briefing_2020.pdf. The Broadband Commission for Sustainable Development was established in 2012 to measure and report in its flagship State of Broadband annual report on Broadband Targets for 2015 in line with the Millennium Development Goals, now the Sustainable Development Goals. One of its seven targets for 2025 is to Make Broadband Affordable in developing countries at less than 2 percent of monthly Gross National Income (GNI) per capita. Source: https://www.broadbandcommission.org/broadband-targets/

BOX 2. Public consultation on the rollout of 5G in Moldova

Beginning in 2019, Moldova's then-Ministry of Economy and Infrastructure held regular public consultations on the rollout of 5G in Moldova with representatives from Orange, Moldcell, Moldtelecom, the National Agency for Public Health, the National Radio Frequency Management Service, and the National Agency for Regulation in Electronic Communications and Information Technology. The discussions focused on elaboration of the new Radio Spectrum Management Program, mobile communications operators' plans for next generation 5G technologies, and issues concerning the protection of public health. During the consultations, it was agreed to support a working group comprised of all responsible institutions, to develop a regulatory framework and subsequent evolutions for the implementation of 5G technology in Moldova. Recently, these discussions were relaunched with the goal of coordinating operator readiness to invest. GoM is taking further steps in this regard. Regional evolution in 5G deployment and internal competition will remain determinant, but so far no important steps forward have been observed.

The GoM views 5G as an important stimulant for the future growth of Moldova's ICT sector. GoM's plans for the rollout of 5G are detailed in the Spectrum Management Program (2021-2025), which was developed by the Ministry of Economy and Infrastructure and supported by the ITU's Regional Office for Europe and the Korean Information Society Development Institute. In a January 2019 meeting with high level government representatives, the PRC-based company, ZTE, shared its plans to support the implementation of 5G technology in Moldova.[59]

BOX 3. Lack of interest or awareness in emerging technologies

Documented policy dialogue initiatives or flagship projects on emerging technologies such as the Internet of Things, Artificial Intelligence, Virtual or Augmented Reality, Big Data, are not readily available. Moreover, interviewees did not reflect on the topic of emerging technologies regardless of their potential application apart from the recognition that Moldova is lagging behind in this respect and needs to catch up.[60]

2.1.6 CYBERSECURITY POLICY, CAPACITY, AND THREATS: GAPS PERSIST

CAPACITY GAPS UNDERMINE MOVES TO ALIGN CYBERSECURITY POLICIES WITH THE EU

In response to the growing security demands posed by digital transformation in Moldova, over the past decade, the GoM gradually introduced regulatory and policy measures on cybersecurity. With Moldova's EU membership aspirations and as a member of the EaP, Moldova's cybersecurity policies are being drafted to harmonize with EU cybersecurity protocols.[61] However, these efforts fall short of being comprehensive or fully institutionalized and implemented.

KEY TERMS | BOX 3. Cybersecurity, cyber risks, and digital trust

Cybersecurity is the activity or process, ability or capability, or state whereby information and communications systems that support or affect development outcomes, and the information contained therein, are protected from and defended against damage, unauthorized use or modification, or exploitation.

Cyber risks are the potential for financial loss, disruption, or damage to the reputation of an individual, organization, or government from failure, unauthorized or erroneous use, or other malicious exploitation of its information systems.

Digital trust is created when users have confidence in an online system, network, or technology and trust that their data and privacy are being protected when using them.

Source: USAID Cybersecurity Primer[62]

MOLDOVA'S RANKING ON THE GLOBAL SECURITY INDEX DROPPED IN 2020

Noting the realities mentioned above, it is not surprising that between 2018 and 2020 Moldova fell by 10 points on the Global Cybersecurity Index (GCI) from 53rd to 63rd place.[IX] The GCI ranks each country's level of development on its legal, technical, and organizational measures, as well as on its capacity development and cooperation. Though the GCI scores Moldova's technical cybersecurity measures as "relatively strong," its organizational and capacity building need improvement. Other recommendations from the GCI include the development of a strategy on the protection of critical infrastructure and systematic implementation of Information Security Management Systems which will require an increase in the number of certified line ministries with the ISO 27001 standard.[63]

"The COVID-19 pandemic has catapulted the potential of a cybersecurity crisis to the forefront as government institutions, businesses, and the general public have migrated en masse to the online space with very low or nonexistent cybersecurity literacy. The general public and most public institutions have no cyber hygiene basics such as the identification of incidents."

– ANONYMOUS DECA INTERVIEWEE

NATIONAL INFORMATION SECURITY STRATEGY 2019-2024 REFLECTS THE CURRENT CYBERSECURITY NEEDS BUT ITS IMPLEMENTATION IS LAGGING

The Information Security Strategy 2019-2024 and its Action Plan is the core policy document that currently governs the cybersecurity sector in Moldova. It succeeds the National Cyber Security Programme (2016-2020) (est. budget of 76,941,000 MDL, approx. 3.6 million EUR) and focuses on four priority areas:[64]

1. Ensuring the security of the cyber information space and investigating cyber crime;
2. Ensuring the security of the media information space (relates to managing online misinformation, propaganda);
3. Strengthening operational capabilities; and
4. Ensuring efficiency of internal coordination and international cooperation in the field of information security.

IX In comparison to its neighboring countries, Romania ranks 62, Georgia 55, Ukraine 78. "Global Cybersecurity Index 2020." 2021. ITU. http://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2021-PDF-E.pdf.

These priorities speak to current cybersecurity realities and needs in Moldova. Yet when looking at the Strategy's midterm results, there are gaps in its implementation. For example, in the first priority area, only one out of the three KPIs—the creation of a Government CERT—has been achieved. The remaining two KPIs—the creation of a National Cyber Security Incident Response Center (National CERT) and strengthened cooperation between the different levels of CERTs–have yet to be implemented. A comprehensive legislative framework for cybersecurity and critical infrastructure has also not been developed.[65]

INSTITUTIONAL FRAMEWORK ON CYBERSECURITY LACKS COHERENCE AND COORDINATION

Responding to modern cyber threats in any country takes a coordinated effort of numerous institutions. Coordination requires the designation of clear roles and responsibilities to pertinent institutions and their capacity to perform them. National computer emergency or security incident response teams (CERTS/CSIRT) act as important single points of contact for all vested stakeholders (government, private sector and societal). They are typically responsible for information sharing and for handling government's responses to cybersecurity incidents in a coordinated manner. Currently Moldova does not have a national CERT. Instead, partial responsibilities for cybersecurity are spread among the following institutions: Ministry of Economy, Information Technology and Cyber Security Service (STISC), Computer Emergency Response Team under STISC (CERT-GOV-MD), E-governance Agency, Ministry of Defense, Ministry of Internal Affairs, Information and Security Service, General Prosecutor's Office, State Chancellery and the Parliamentary Committee for National Security.[66]

MOLDOVA'S GOVERNMENT CERT IS LIMITED AND INSUFFICIENT FOR THE GROWING NEEDS IN THE CYBERSECURITY SECTOR

The government CERT-GOV-MD was established in 2010,[67] fully formalized in 2021, and embedded within STISC (which has 292 employees, including full technical and engineering staff). It is Moldova's primary coordinating body on cybersecurity[68] with competence to prevent, analyze, detect ,and respond to cyber incidents at the government level, as well as to build capacity (organizing joint cybersecurity workshops, trainings) and awareness (organization of cybersecurity conferences) on cyber resilience topics. However, it has a team of only four personnel,[69] no separate annual budget, no investigative powers, no right of legislative initiative, rendering it institutionally weak. Its powers are limited to acting as an operational unit with mere advisory, monitoring, and training capacities. Without a system of well- staffed Departmental CERTs with designated chief information security officers, this illustrates the structural shortcomings of Moldova's cybersecurity system. Due to its low budget, the CERT lacks basic instructional videos, public outreach materials, or an appropriate platform through which to engage with the government and private sector.[70]

MINISTRY OF ECONOMY IS RESPONSIBLE FOR LEGISLATION AND POLICY DEVELOPMENT ON CYBERSECURITY

The government CERT-GOV-MD established in 2010,[71] fully formalized in 2021 and embedded within STISC (which has 292 employees, including full technical and engineering staff) is the core coordinating body on cybersecurity in Moldova.[72] It has competence to prevent, analyze, detect and respond to cyber incidents at the government level as well as to build capacity (organizing joint cybersecurity workshops, trainings) and awareness (organization of cyber security conferences) on cyber resilience topics. However a lack of resources weakens the effectiveness of the CERT.[73]

DDOS ATTACKS AND SOCIAL ENGINEERING ARE THE MOST COMMON TYPES OF CYBER THREATS

When looking at the reality of cyber security threats, since 2015, Moldova's Intelligence and Security Service describes four prevailing types: distributed denial of service (DDOS), phishing via state email, brute force attacks to gain access to government information systems, and the hijacking of official webpages.[74] In interviews, CERT-GOV-MD confirmed that most frequent cyber threats in Moldova include DDOS attacks, fraudulent payments (related to digital services), social engineering (phishing, baiting, fake news, disinformation, stolen credentials), and data breaches. Russia was not mentioned as a source of cyber attacks. This is likely due to the sensitivity of the topic. Interviews also revealed that subversive propaganda, fake news, and disinformation content is on the rise (see Pillar 2: Digital Society, Rights, and Governance for additional details) and populations close to the Transnistria territory are targeted in particular.

OVERARCHING SYSTEMIC SHORTCOMINGS IN THE CYBERSECURITY SECTOR

Overall, among the most pronounced concerns raised during interviews is the current absence of a fully adopted legislation on cybersecurity and on the protection of critical infrastructure, for which the Ministry of Economy is responsible. Other systemic gaps related to cybersecurity that emerged during interviews include diagnostic capacity gaps, missing intra-institutional audits, and a lack of public awareness materials regarding cybersecurity.

BOX 4. International Standard on Information Security Management (ISO/IEC 27001) explained

ISO 27001 Standard provides internationally accepted requirements for the implementation and continued maintenance of information security management systems in order to preserve the confidentiality, integrity, and availability of information stored or managed by such systems.[X] Adoption of the standard ensures that certified entities (e.g., government, private sector, civil society) will exemplify reliability in:

- systematic examination of the organization's information security risks, taking account of the threats, vulnerabilities, and impacts;
- designing and implementing coherent and comprehensive information security controls and other forms of risk treatment (e.g., risk avoidance or risk transfer) to address risks that are considered unacceptable; and
- adopting an overarching management process that ensures that information security controls continue to meet the organization's information security needs on an ongoing basis.

PRIVATE SECTOR COMPANIES, ISPS, AND IT SERVICE PROVIDERS OUTSTRIP GOVERNMENT INSTITUTIONS IN CYBERSECURITY READINESS

According to interviewees, the private sector in Moldova has stronger cyber security capabilities than those found in the public sector. The National Bank of Moldova leads in this department. It oversees regulatory compliance on cybersecurity within the financial sector. In addition to the National Bank of Moldova, foreign-owned companies operating in Moldova are considered to have the most advanced cybersecurity systems and resources to afford relevant expertise.[75] SMEs are considered more disadvantaged although reliable evidence about the private sector's cybersecurity readiness is not readily available.

X International Standards Organization (ISO) is an independent, non-governmental international organization with a membership of 167 national standards bodies. Its experts develop voluntary, consensus-based, market relevant international standards for government bodies, private sector, and civil society entities that support innovation and provide solutions to global challenges. "ISO/IEC 27001 — Information security management." n.d. ISO. Accessed August 3, 2022. https://www.iso.org/isoiec-27001-information-security.html.

BOX 5. A rapid assessment of private sector cybersecurity readiness carried out through the DECA in collaboration with AmCham

From January 24 to February 11, 2022 the DECA Research Team in partnership with AmCham Moldova implemented a rapid assessment using an online survey distributed to AmCham members. The survey included eight questions on the cybersecurity and data protection readiness of respondents. The survey received a 37.5 percent response rate (36 responses out of 96). The majority (58 percent) of the respondents were larger companies with more than 250 employees, 17 percent were companies with 150-249 employees, and 6 percent were small companies with 1-9 employees. Nearly three-quarters (72 percent) were foreign-owned companies, while 28 percent were locally owned.

Summary of results:

- **General satisfaction with managing cybersecurity inside companies is high:** 57 percent of respondents claim to be very satisfied and 34 percent are somewhat satisfied with their companies' internal policies on cybersecurity; 51 percent considered their internal systems and procedures as very satisfactory while only 3 percent were very dissatisfied; 43 percent are very satisfied with their companies' resource allocation for cybersecurity. Respondents were the least satisfied with employees' skills in cybersecurity.
- **Most companies have a dedicated cybersecurity staff:** 59 percent of companies have a designated full-time and 21 percent have a part-time employed cybersecurity staff, 35 percent use software, and 15 percent outsource cybersecurity to external service providers.
- **Social engineering and malware are the most commonly experienced cyber attacks** among 60 percent of respondents. DDoS came in second among 45 percent while advanced persistent threats were least commonly reported in 10 percent of cases.
- **Only 17 percent of companies have an insurance policy for cybersecurity recovery:** 40 percent companies claimed that they do not have such a policy and 43 percent stated that they are not sure if they have a policy.
- **Future support needs:** improving national legislation on cybersecurity (71 percent) and targeted modular training for employees (59 percent) were the prioritized forms of support requested; 50 percent requested expert guidance on the development of in-house cybersecurity systems and procedures while 18 percent were interested in receiving assistance for purchasing software.

CYBERSECURITY SPECIALISTS ARE COSTLY AND IN SHORT SUPPLY

Cybersecurity specialists are reportedly in short supply, even though the private sector has the resources for hiring. Specialists that are available are expensive and are quickly hired by foreign-owned companies; the government cannot afford this expertise. This disadvantages SMEs. While the Technical University of Moldova offers courses on cybersecurity, they fall short when it comes to supplying the sector with specialists.

2.1.7 PROTECTION OF SAFETY OF CHILDREN ONLINE IS GAINING GROUND

In 2012, Moldova ratified the Lanzarote Convention on the Protection of Children against Sexual Exploitation and Sexual Abuse.[XI] While its national legal framework has not yet fully integrated the Convention's provisions, GoM has made numerous efforts to prevent potential risks and to protect children from harm online. These include:

- Action Plan (2017-2020) promoting the safety of children and adolescents on the Internet aimed to reduce illegal content, promote a safer digital environment, raise awareness about the risks involved for children, compile statistics, and promote research on the topic.[76]
- Inclusion of the issue in Digital Moldova 2020 Strategy and the National Cyber Security Program (2016-2020); both listed child pornography as a cybercrime.
- Moldova's Information Security Strategy (2019-2024) and its Action Plan protect children from any form of online abuse and promote a safer Internet for children through online counselors and by encouraging reporting through specialized information projects.

EFFORTS BY CIVIL SOCIETY TO COMBAT SEXUAL EXPLOITATION OF CHILDREN ARE GROWING, BUT LARGELY PROVIDED BY A SINGLE NGO—LA STRADA

Since 2004, the multi-stakeholder annual awareness campaign Safer Internet Day (SID) in Moldova has kept children, their parents, and teachers informed about potential online harms and available means of support. The SigurOnline platform,[77] managed by the non-governmental organization La Strada, provides educational and counseling information about online child protection.[78] La Strada also publishes studies on children's behavior online along with a guide that empowers parents to better understand their child's online behavior. La Strada also implements the Intersection Program, which connects a community of teachers in 60 educational institutions across Moldova. La Strada is working with UNICEF to develop 12 educational bilingual videos on protection of children online. In 2022, the Ministry of Education, Culture, and Research plans to organize a national contest involving teachers, parents, and children aimed at strengthening the school-pupil-family partnership to promote internet safety for children.[79] La Strada is also funded by U.S. Government projects including Strengthening Moldova's Capacity to Address Child Online Sexual Exploitation and Abuse[80] and by two projects from the Council of Europe, including the Protecting Children from Sexual Exploitation and Sexual Abuse in the Republic of Moldova project and the Combating Violence Against Children in the Republic of Moldova project.[81]

WHAT IS MISSING IN THE PROTECTION OF CHILDREN AND YOUTH FROM ONLINE HARMS?

GoM policy documents reveal a complex approach to protecting children from online harms, but these policies are not explicitly linked. An inter-institutional coordination mechanism for coordinating online child safety efforts is lacking. Other gaps that necessitate improved compliance with ITU Child Online Protection Guidelines include:[82]

- Elaboration and dissemination of mechanisms for reporting illegal online content; this is in early stages.
- School curricula, educational policies, professional training programs for teachers, and parenting skills initiatives do not adequately integrate modules on safety of children online.

XI In addition to the Lanzarote Convention, Moldova has signed the following: UN Convention on the Rights of the Child (CRC); the Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography (OPSC); the Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children (Palermo Protocol); the Council of Europe (CoE) Convention on Cybercrime; and the CoE Convention on Action against Trafficking in Human Beings.

- Several specialized structures have been institutionalized in the justice system—the Anti-trafficking Bureau at the General Prosecutor's Office and child protection units in police bodies—and are mandated to investigate and criminally prosecute offenses related to the topic, but their capacity to implement and coordinate their mandates is weak.
- Inadequate capacity of law enforcement entities to develop guidelines for conducting criminal investigation and prosecution of crimes involving sexual abuse and sexual exploitation online.
- Low number of specialists with relevant professional training in the child protection system.
- Low public awareness about what constitutes online child sexual abuse and attendant low reporting.
- Lack of comprehensive institutional policies promoting online safety and reporting mechanisms for online sexual abuse of children to the police.[83]

BOX 6. Recommendations for authorities by Moldovan child survivors of online sexual abuse

In 2021, through La Strada, 54 Moldovan social specialists and 10 survivors of online sexual abuse and exploitation took part in an international study that assessed the quality of reporting mechanisms and support services provided to children subjected to online violence.[84] The key conclusions and recommendations of the research provided below were shared at a multi-stakeholder round table on November 18, 2021 as part of the annual European Day for the Protection of Children against Sexual Exploitation:

- Support and reporting services for cases of sexual abuse must be promoted more effectively. Any child victim of abuse and exploitation in the online environment should know where to report abuse and how to find specialists who can help them.
- Parents or carers of children who have been abused online should also receive support.
- Children should be able to choose the professionals they work with, including their gender.
- Efforts are needed to avoid repeated trauma to children and to ensure confidentiality at all stages of the justice process and in the provision of support services.
- A service to block and remove child sexual abuse material from the Internet is needed.

These recommendations will be taken into account by the Ministry of Labor and Social Protection in the process of developing the new National Program for Child Protection.[85]

FUTURE POLICY PLANS

The Minister of Labor and Social Protection announced that the renewed National Programme for Child Protection (NPCP) and its Action plan will be approved in 2022. The NPCP comprises three key objectives and seventy-one actions. The topic of online child exploitation falls under Objective 2 and requires that adults and children manifest zero tolerance toward any form of violence against children. Online child protection is a priority policy area for the GoM.

2.1.8 DIGITAL MEDIA AND INFORMATION LITERACY

PEOPLE TURN TO SOCIAL MEDIA FOR INFORMATION AS PUBLIC DISTRUST IN TRADITIONAL MEDIA RISES

In 2013-2020 Armenia, Georgia, and Ukraine improved their media freedom rankings, while Azerbaijan, Belarus, and Moldova regressed in their scoring, according to the World Press Freedom Index.[86] Overall, social media is the primary source for obtaining news and information in Moldova. Seventy-two percent of Moldovans use social media and 61 percent use search engines daily.[87] Television is the next most popular source of news and information (70 percent) while only 29 percent use radio and 11 percent read newspapers. Women (79 percent) get news from television more than men (60 percent), whereas a higher proportion of men use the radio (34 percent of men vs. 25 percent of women). Age is another indicator for how Moldovans get news. Young adults rely mostly on digital platforms (93 percent) and adults over 55 years old turn to television for news.[88]

TRUST IN MEDIA IS LOW BUT THIS IS NOT UNIQUE TO MOLDOVA

Forty-two percent of respondents reported satisfaction with the media in Moldova in a 2021 Thomson Reuters Foundation study, Only 19 percent of respondents said they trust the news most of the time, and men are more distrustful of the news than women (31 percent vs. 23 percent). Most Moldovans get their news from social media, although their trust in news coverage on television (31 percent) scored higher than their trust in social media (24 percent). Both television and social media are trusted more than online news websites (16 percent) and radio (3 percent). One in five people (20 percent) said that they did not trust any of the sources, while older adults were significantly more likely to select television than other age groups. Only 18 percent of respondents claimed to follow news only from independent sources while 38 percent said they follow the news but could not name which sources were independent.[89] In Moldova, the majority of television channels offered by Moldtelecom, Starnet, Orange, Internet Protocol Television and other providers are in Russian language or originate in the Russian Federation which contributes to the general sense of distrust.[90] These high levels of distrust in the media are not unique to Moldova. The 2019 Eurobarometer survey showed that only 10 percent of EU adults "definitely agree" with the trustworthiness of media while 46 percent agree only "to some extent", with the highest trust observed in Denmark, Finland (both 28 percent), and Sweden (24 percent).[91]

NATIONAL EDUCATION POLICIES FEATURE DIGITAL LITERACY BUT PROGRAMMING SUPPORT IS WEAK

Strengthening digital literacy is supported at the national policy level. On the 2019 Global Competitiveness Index, the Moldovan population ranked 55 out of 140 countries in digital skills.[92] Estonia, Romania, Ukraine, and Georgia were ranked 8, 53, 56, and 107, respectively. Moldova has a relatively strong level of digital skills readiness in comparison to its regional and international peers. The Education 2020 Plan,[93] the National Strategy Digital Moldova 2020, and the National Strategy for the Development of VET system (2013-2020) promote the effective integration of ICT in education by modernizing teaching and learning practices, updating equipment for educational institutions, and increasing the efficiency of school management systems through IT. In response to the COVID-19 pandemic, the (then) Ministry of Economy and Infrastructure, the Ministry of Education, Culture and Research, the National Association of Information Technology and Communications Companies, and the Tekwill ICT Training and Innovation Center signed a new MoU on the Development of Digital Skills IT and STEM throughout life in July 2020. Conclusive midterm or performance and impact assessments on these plans and strategies or on the renewed national strategy on digital literacy are not

available.[XII] Some observe that insufficient institutional support and low project implementation capacities impede efforts to increase digital literacy, yielding only a modest contribution to the transformation of the educational system and had a reduced impact on the digital transformation of society.[94]

COMPLETED OR ONGOING DIGITAL LITERACY PROGRAM IMPACT ON THE BIG PICTURE IS UNCLEAR

A number of programs addressing digital literacy are completed or are currently underway in Moldova. Donor-supported programs such as Tekwill in Every School (ATIC/USAID),[95] Startup Moldova,[96] Tekwill Academy (USAID),[97] Tekwill Academy for Kids,[98] Tech Age Girls (IREX/ USAID)[99] are in progress and focus on upskilling younger generations with digital skills. SELFIE-EU Commission/ European Training Institute[100] and the Deutsche Welle (DW) Akademie in collaboration with State Pedagogical University Ion Creangă in Chisinau are implementing an advanced media information literacy training for school teachers.[101] The multi-year Media Enabling Democracy, Inclusion and Accountability in Moldova (MEDIA-M) project,[102] funded by USAID and UK Aid boosts civil society's capacity to effectively monitor media and to improve the legal and regulatory environment for independent media. Other programs such as the UN Women in Tech Project or the ReSTART Programme (2017-2020) have ended and it is unclear whether they will be continued.[103] Less visible are media information and literacy programs and public awareness campaigns for the general public. The completed Novateca Global Libraries Program (carried out by the Bill and Melinda Gates Foundation and USAID/Moldova) was favorably regarded by interviewees, but it focused more on relevant information and services rather than on teaching digital skills.[104]

PRIVATE SECTOR SUPPORTING DIGITAL LITERACY INITIATIVES

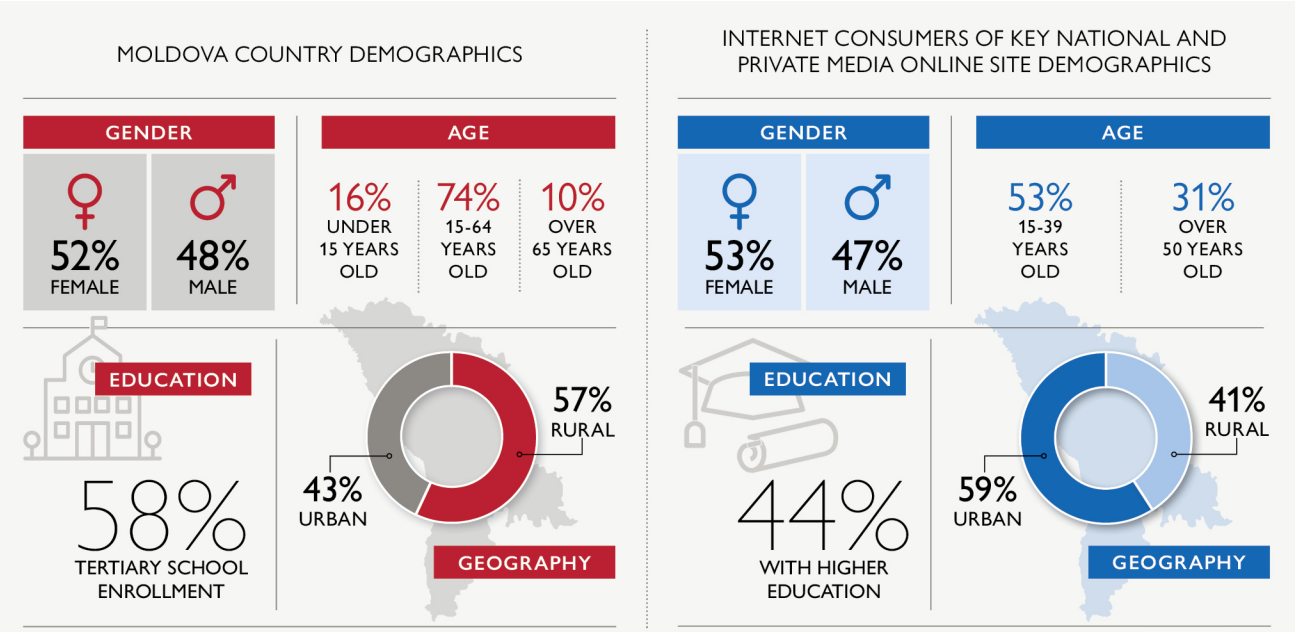
Moldcell Foundation has several pilot projects aimed at digital literacy targeting youth to teach the elderly how to use mobile phones, internet, social media, online payments, and e-gov services.[105] It supports parental education and awareness building to mitigate risks and enhance the safety of children online. StarNet Moldova leads several initiatives in IT connectivity and talent development through their Future Classroom at both the elementary and high school level. Orange Foundation Moldova implements a Solidarity FabLab (2020)—Access Your Future via FabLab via the NGO Asociatia Umanitara "Ajutam Impreuna in fiecare zi"—which helps young people in difficulty develop digital skills in order to get into the job market.[106] More than 75 young people benefited from the FabLab and will be matched with professionals from local businesses. The Orange Foundation also supports Women's Digital Centers. Three centers were created in 2020 in Ungheni, Sangerei, Cahul.[107] Orange deploys these centers in 24 countries with a program that trains vulnerable women to develop their digital and entrepreneurial skills so they can launch, manage, and promote small businesses.

2.1.9 DIGITAL INCLUSION: UNPACKING AN INVERSE GENDER GAP

The 2020 BATI Online Audience Study (Figure 9 and 10) provides demographically disaggregated data on internet users of key national and private media online sites:[108]

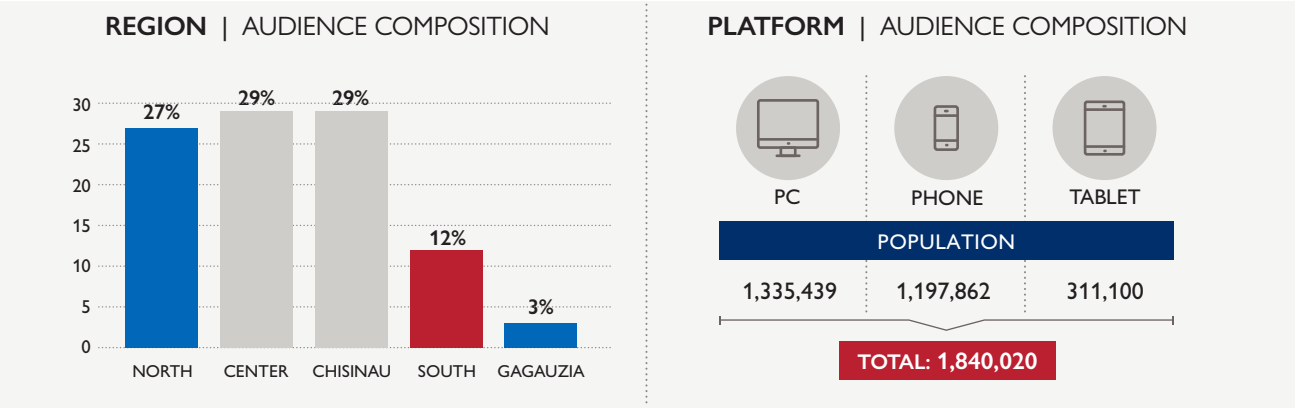
XII Assessed data should be readily available on: basic computer skills and computing courses in secondary education; proportion of graduates in ICT related fields at post-secondary levels; individuals with ICT skills, by type of skill; percent of youth and adults who have achieved a minimum level of proficiency in digital literacy skills; learner-to-computer ratio.

FIGURE 9. Internet user data demographics



Sources: education, geography, and gender: World Bank Databank; age: Wikipedia; internet users: BATI Online Audience Study

FIGURE 10. Internet user data by platform and region



Source: BATI 2020

When it comes to social media use and mobile phone ownership there is no digital gender gap of note. Yet qualitative accounts of women's empowerment programs point to gender gaps in digital skills. These are most pronounced in STEM and ICT-related professions (see Box 7 on the Empowering Women in Tech Project). A comprehensive understanding of specific skills such as content creation or the use of advanced applications for professional self-development or entrepreneurship among urban, rural, or marginalized youth is not available. As technologies advance, renewed assessments on digital literacy, media and information literacy, and updates to digital training content are needed. It is essential to address topics such as cyber hygiene, data protection, emerging technologies, digital ethics or discerning harmful content on social networking sites.

BOX 7. UN Women Case Study: empowering women in tech project (2018-2020)

With a budget of USD 230,340, the UNWomen Empowering Women in Tech project mainstreamed and promoted the empowerment of women through ICT. Women and girls and under-represented groups from across Moldova were targeted. The project was implemented by Tekwill and the National Association of ICT Companies (ATIC) focusing on three tracks:

1. Provision of Tech Women Courses (online/offline) for 300 women in different IT domains—digital education, front-end web development, Java, graphic design, soft skills;
2. ICT career orientation and promotion for girls and women through events and PR campaigns to build the image of the ICT industry and to encourage girls and women to pursue ICT career development; and
3. Monitoring career paths and support to 50 girls and women who benefited from IT scholarships in Java, SQL, Cisco.

Five hundred women completed a FrontEnd Development course, 200 participated in bootcamps, 20 women were employed by IT companies. Eight orientation sessions were held to inform 600 girls about IT professions and opportunities; five women's success stories were shared in media and more than 300 girls and women participated in an organized Tech Women Summit. More than 1,000 women registered for the second edition of the National IT Program for girls and women (Front End Development, Software Tester, Digital Skills), and more than 30 (out of 50) girls and women who received IT scholarships (Java, SQL, Cisco) found a job in IT.[109]

ICT ACCESSIBILITY FOR PERSONS WITH DISABILITIES

In 2010, Moldova ratified the Convention on the Rights of Persons with Disabilities (UNCRPD) but without ratifying its Optional Protocol. The UNCRPD stipulates that countries should ensure that persons with disabilities have equal access to the physical environment, transportation, information and communications (ICTs) systems. In 2017, Moldova adopted the National Program for Social Inclusion of Persons with Disabilities (2017-2022). OHCHR's first evaluation in 2017 recognized accelerated efforts to improve access to ICT for persons with disabilities but also stated concerns about accessibility standards with the following recommendations:

- Adopt a timebound online accessibility plan of action, including the enforcement of sanctions for non-compliance and ensure implementation and monitoring in close consultation with persons with disabilities and their representative organizations.
- Ensure accessibility to infrastructure, transport, information, and communications for people with disabilities—e.g., compliance with Government Decision No. 188/2012/2018 which specifies requirements for government websites in line with Web Accessibility Initiative guidelines.
- Integrate design, development, production, and distribution of accessible ICTs and ICT systems across government bodies and services.
- Implement ICT accessibility training courses for education staff and provide them with information, media, and related education materials.
- Establish financial plans to support the provision of accessible ICT products and services for persons with disabilities.[110]

As part of its information and digital literacy campaign entitled "e-Governance for everyone," EGA, in partnership with Transparency International-Moldova, organized a roundtable in June 2021 on electronic services for representatives of associations working with people with disabilities. The information session focused on obtaining access to electronic social services: allowances, benefits, exemptions, aid and other services of interest to participants in the event. During

the first quartar of 2022, in collaboration with EGA, the Modernization of Government Services Project (MGSP) launched a call for proposals for the roll-out of comprehensive, socially inclusive, and gender-sensitive citizen outreach through a public awareness campaign, using distribution channels that reach socially vulnerable groups (women, youth, elderly, linguistic and ethnic minorities, people with disabilities, people living in remote areas, people with low literacy levels, people with low IT skills or limited access to digital tools).[111]

2.2 PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

Digital society, rights, and governance focuses on how digital technology intersects with government, civil society, and the media. This pillar is divided into three subsections: Internet Freedom; Civil Society and Media; and Digital Government. Internet Freedom explores factors that enable or constrain the exercise of human rights and fundamental freedoms online. This includes individual rights to freedom of speech, privacy, and free assembly, and the abuse of these rights through digital repression. Civil Society and Media identifies key institutions and how they report on, advocate around, and influence online freedoms. Digital Government looks at the government's efforts to manage internal IT processes and systems, deliver citizen- and business-facing e-services, and engage with the public through digital channels.

DIGITAL SOCIETY, RIGHTS AND GOVERNANCE

KEY TAKEAWAYS

- Moldova's e-government architecture and digital service delivery is advanced and concentrated at the national level with more than 200 public services partially or fully digitized, but is limited at the local level.
- The government has expanded its use of participatory technologies on the supply side with sub-optimal adoption by civil society and citizens.
- Data protection awareness and implementation of policies within the government and civil society is limited.
- The spread of misinformation increased during the COVID-19 pandemic, but so have general levels of digital literacy and the ability of citizens to detect such misinformation.

RELEVANT RECOMMENDATIONS

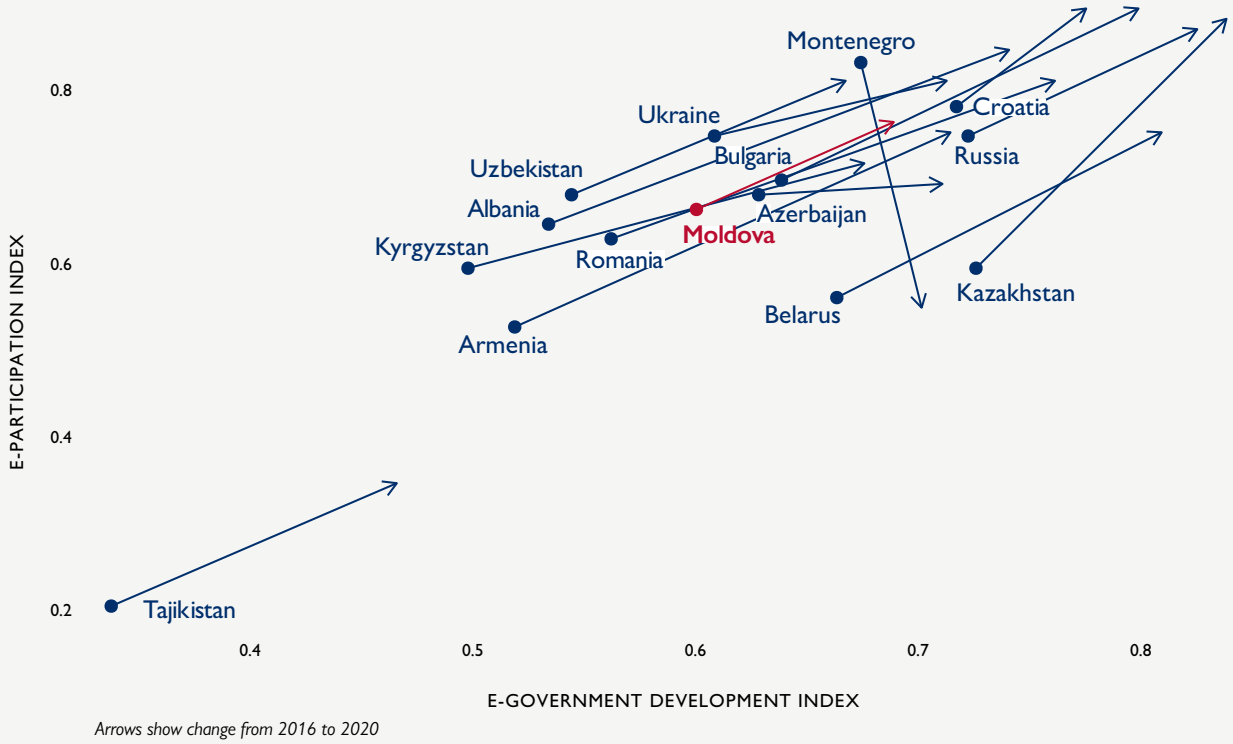
- Build government capacity for data protection policy implementation and civil society capacity for holding the government accountable
- Enhance local efforts for e-democracy through tailored trainings on the development of participatory digital tools
- Strengthen local government capacity to integrate digital systems that increase transparency and data-driven decision making
- Increase awareness of digital rights protection best practices in partnership with the Internet Governance Forum
- Coordinate with other donors to expand government digital services with a focus on supporting SME growth

INTRODUCTION

Robust e-government architecture exists at the national level but is limited at the local level. Over the past decade, the Government of Moldova (GoM) has steadily developed its e-government architecture through an ambitious series of open-source, cloud-based, interoperable platforms instituted at the central government level. It has also expanded the range of digital services available to Moldovan citizens and businesses. Currently more than 200 public services have been partially or fully digitalized and citizens can get access to 648 public services through the central public services portal.[112] These initiatives laid an important foundation for modernizing the government administration and are valued by Moldovans who view the digitization of public administration as an important tool for curbing corruption and increasing efficiency. However, several DECA interviewees observed that existing e-government infrastructure has been built asymmetrically in favor of central government institutions while the digital readiness of lower levels of government lags behind. User uptake of available e-services is also suboptimal.

While on an upward trajectory since 2005 and in line with its regional counterparts (see Figures 11 and 12) between 2018 and 2020, the UN E-participation Index (EPI) score declined while the 2020 UN E-government Development Index (EGDI) score showed Moldova to be more in line with the regional average and continuing to increase gradually.[113, XIII]

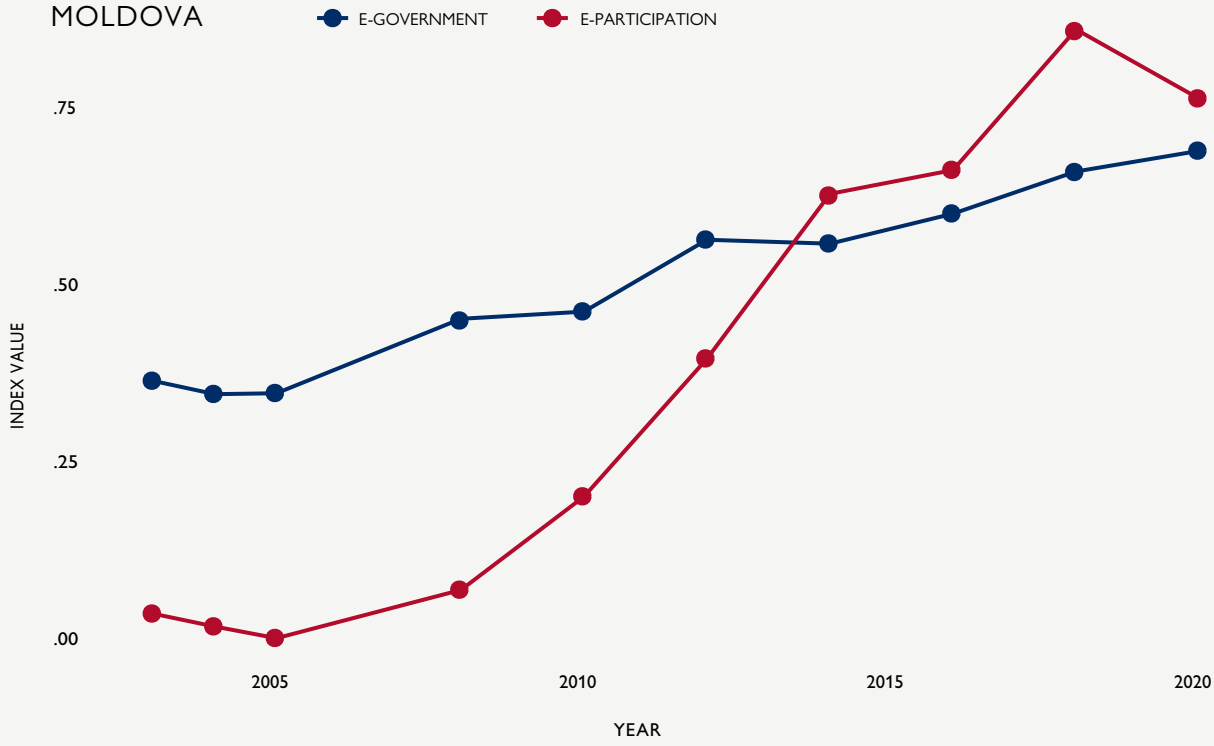
FIGURE 11. E-government and e-participation, change 2016-2020



Source: UN EGDI and UN EPI

XIII The EGDI, published biannually, measures the state of E-Government Development of United Nations Member States by incorporating three composite dimensions of e-government: 1) the provision of online services; 2) telecommunication connectivity; and 3) human capacity. The E-Participation Index (EPI) is a supplementary index to the UN E-Government Survey focusing on the government's provision of services to citizens related to e-information sharing, interaction with citizens through e-consultations, and enabling citizens to engage in e-decision making.

FIGURE 12. E-government and e-participation, change 2002-2020



Source: UN EGDI and UN EPI

2.2.1 POLICIES, REGULATION, AND LEGISLATION

Moldova has no shortage of legislative acts related to digital government (see Table 1). In the past decade, significant progress has been made, and the current GoM places digital transformation high on its agenda. Yet, numerous sectoral strategies and programs recently expired with nothing in place to succeed them. In several areas such as data protection and cybersecurity, existing legislation is outdated. Due to rapid developments in the technology sector, several stakeholders suggest that future strategies should be more short-term than focused on the long term.[114]

TABLE 1. Overview of legislative acts and policies related to digital governance

GOVERNANCE DOMAIN	LEGISLATION
Access to Information	• Law on Access to Information (No. 982-XIV, 2011, amended in 2018)[115] • Code for Audiovisual Media Services (2017): improved the legal framework regulating media activities[116]
Data Protection	• Draft law on the National Center for Personal Data Protection (No.422, 2018) and Draft law (No. 421/2018) addressing Moldova's alignment of data protection legislation with GDPR.[117] • Law amending the 2007 Electronic Communications Law no. 241-XVI (No. 135, 2017)[118]

GOVERNANCE DOMAIN	LEGISLATION
Data Protection	• Law on enunciation of certain declarations to the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data by the Republic of Moldova (No. 271, 2013)[119] • Law on the approval of the National Development Strategy of personal data protection (2013-2018) and Action Plan for its implementation (No. 229, 2013)[120] • Law on Personal Data Protection (No.133, 2011)[121] • Law amending and completing gaps in legislative acts (No. 208, 2011); (Law No. 222/619, came into force in 2012)[122] • Law on the National Center for Personal Data Protection (No. 182-XVI, 2008)[123]
Digital Transformation	• GoM Decision on the approval of 2014 Action Plan for the implementation of the Strategic Program for Technological Modernization of Governance (e-Transformation) No. 1096 (2013).[124] • Action Plan on Public Services Modernization Reform 2017-2021 continues to advance the e-Government Transformation Project whose objective is to increase access, efficiency, and quality of the provision of government services.[125]
Digital Signature (MSign)	• GoM Decision on Integrated Governmental Electronic Service Digital Signature (MSign) (No. 405, 2014)[126]
E-Platform (MPass)	• GoM Decision on the governmental electronic service of access authentication and control (MPass) (No. 1090 , 2013)[127]
Public Services Portal	• GoM Decision on the creation and administration of a unique governmental public services portal (No. 330, 2012)
E-Platform (MLog)	• Order of GoM, No.708 (2014) About government electronic service of recording (MLog).
E-procurement	• Law on public procurement (No. 131, 2015)[128] • Law on the establishment of measures during the state of emergency in public health (No. 69, 2020)[129]
Interoperability	• Decision On Approving the Interoperability Framework Program (No. 656, 2012)[130] • Law on data exchange and interoperability (No. 142, 2018)[131]
Open Data	• Government Ordinance No.43 (2011) on the Launch of the Open Data Portal • Law on Open Data (No. 305, 2012)[132] • Open Government Action Plan 2018-2020[133]
Open Government	• Normative Act on the approval of the Open Government Action Plan (2012-2013) (No. 195, 2012)[134] • Open Government Action Plan (AP) 2018-20 aims to improve access to information, use of open data by citizens, strengthen mechanisms of collaboration with civil society, improve Moldova's diaspora's engagement in decision-making processes, and develop citizen-centered public services.[135] An independent evaluation confirmed that five of the AP's commitments have been substantially or fully completed; one made limited progress.[136] The State Chancellery coordinates and monitors implementation.
E-petitions	• Law on Submission of Petitions (No. 190, 1994)[137]

2.2.2 DIGITAL GOVERNMENT: ADVANCED DELIVERY AND SLOW UPTAKE OF DIGITAL GOVERNMENT SERVICES

The GoM has steadily advanced the digitalization of public services since 2010 when it established the E-Government Center (later—the eGovernance Agency or EGA). At its onset, the E-Government Center was tasked to develop a systematic approach to modernize public services and to bring the government closer to Moldovan citizens. Currently, EGA's competencies include leading the diversification of access to services, digitalization and reengineering of services, developing interoperable solutions for efficiency, ensuring information security, and overseeing the mainstreaming of digital inclusion initiatives.[138]

KEY TERMS | BOX 4. Digital Government

Digital government[XIV] refers to *the use of digital technologies as an integrated part of government modernization strategies to create public value.* Successfully navigating digital transformation requires more than adopting new applications; it requires a shift in processes and attitude toward agile and collaborative decision-making.

Digital government is built around three core functions: *deliver, manage,* and *engage*. The performance of digital government services depends on foundational elements such as change management, human capacity, legislation, policy, regulation, and infrastructure. Investment in these core components and foundational elements can help government bodies become more coordinated, efficient, resilient, proactive, and accountable.

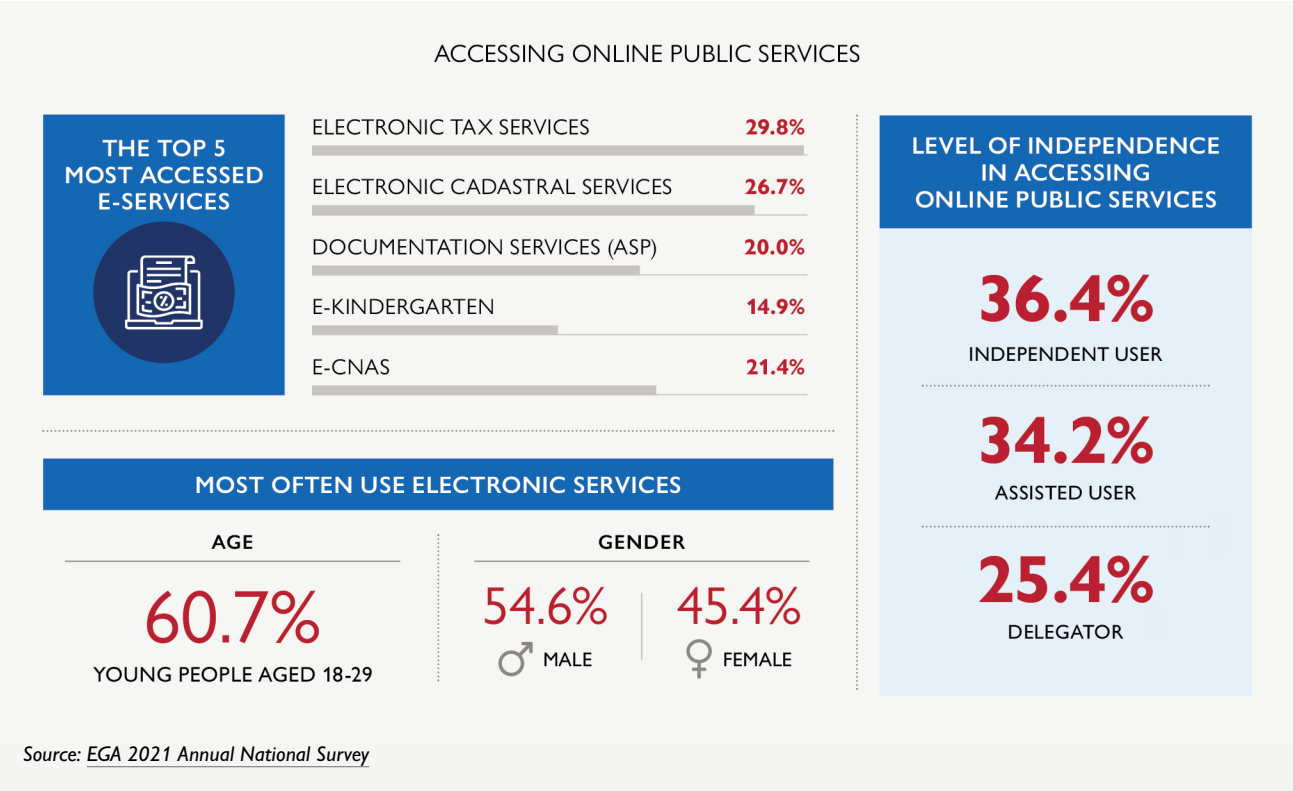
Source: USAID Digital Government Model

ADVANCEMENTS IN THE PROVISION OF DIGITAL SERVICES

According to EGA, over 200 administrative services have been digitalized since 2010.[139] This is an estimated one-third of all targeted e-government services. At least 11 of EGA's projects focus on developing subsidiary digital services for businesses such as online business registration and administration, e-invoice,[140] public procurement,[141] e-licensing,[142] and e-visa.[143] In 2021, the most used e-services included online income tax declarations, cadastral registrations, and obtaining duplicate birth certificates. Since the onset of the COVID-19 pandemic, the demand for electronic services has increased (see Figure 13). Criminal record increased by five percent, e-schooling rose by three percent, and electronic tax services also rose by three percent. Cadastral transactions and electronic notary documents decreased by more than three percent.

XIV USAID uses the term "digital government;" other sources use "e-government" or "e-services" to describe the same functions. Read more in the USAID Digital Government Model.

FIGURE 13. Popularity of services by usage (2021)

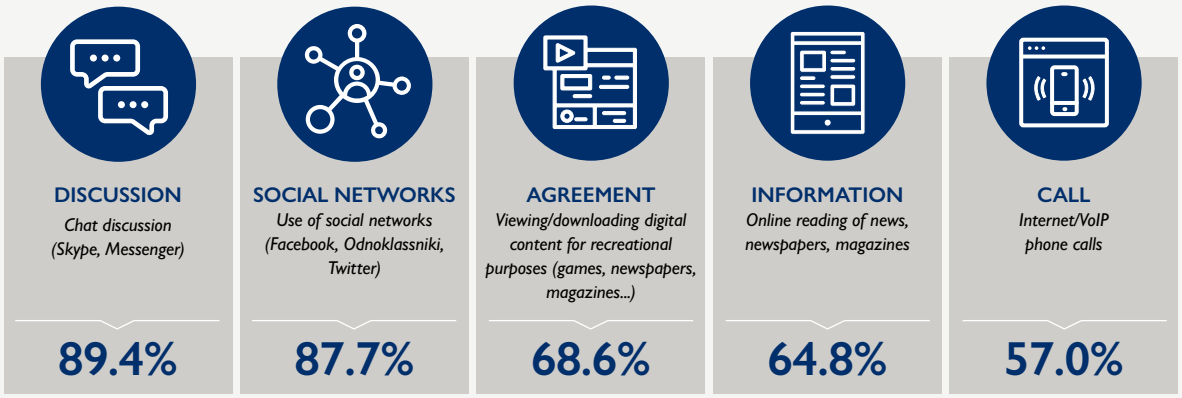


Source: EGA 2021 Annual National Survey

DESPITE AVAILABILITY, UPTAKE OF E-GOVERNMENT SERVICES IS LOW

According to EGA's 2021 Annual National Survey, 23 percent of Moldovans have access to government services online.[144] Between 2020 and 2021, the number of requests rose by nine percent and uploads of information to government institutions by citizens increased by 12 percent. During the same period, the use of e-services rose 2.5 times, particularly among respondents from lower income groups; 37 percent used e-services in 2021 in comparison to 14 percent in 2020.[145] EGA attributes this rise in demand to increased migration of citizens to the online environment during the COVID-19 pandemic. Another rising trend is a preference for using mobile phones over personal computers to get access to government services. Use of mobile phones for this purpose exceeded the use of personal computers by 17 percent.[146] A majority (61 percent) of those using electronic services were between the ages of 18 and 29; 45 percent were women, 34 percent were from rural areas, and 22 percent used the portal from Romania, Italy, the U.K., and Germany.[147] Eighty-nine percent of Moldovans use their phone for chat discussions or to read the news or to order goods online. While businesses are generally more proactive ICT adopters than citizens, the use of electronic signatures and MCabinet is surprisingly low. MCabinet—an identity authentication service—has acquired only 150,000 registered users (of Moldova's 2.6 million people) since its launch in 2012.

FIGURE 14. Purpose of internet usage

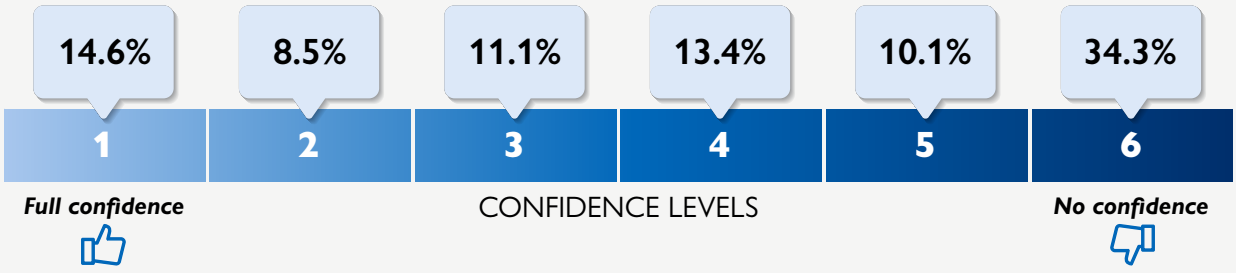


Source: EGA 2021 Annual National Survey

USER SATISFACTION WITH ELECTRONIC PUBLIC SERVICES

Among the reasons provided for the low uptake of e-services is the government's inadequate promotion of e-services and the resulting lack of awareness of these citizens among citizens. Low uptake of e-services is also attributed to low levels of trust as only 15 percent of citizens interviewed reported having full confidence in the quality and safety of e-services, and 34 percent claimed to have no confidence. Actual users of e-services report satisfaction with these services. User satisfaction has grown steadily over time. In 2020, 87 percent of users reported to be satisfied or very satisfied with their experience. In 2021, these figures dropped to 67 percent. TEGA reasons that this drop in satisfaction is due to constraints related to the pandemic, which diminished the general quality of public services, irrespective of how they were accessed. Gender does not play a role in the level of satisfaction but age, place of residence, level of education, and income do factor in. Young urbanites with higher education and income are among those most supportive of e-services.[148]

FIGURE 15. Citizen confidence in the quality of electronic services



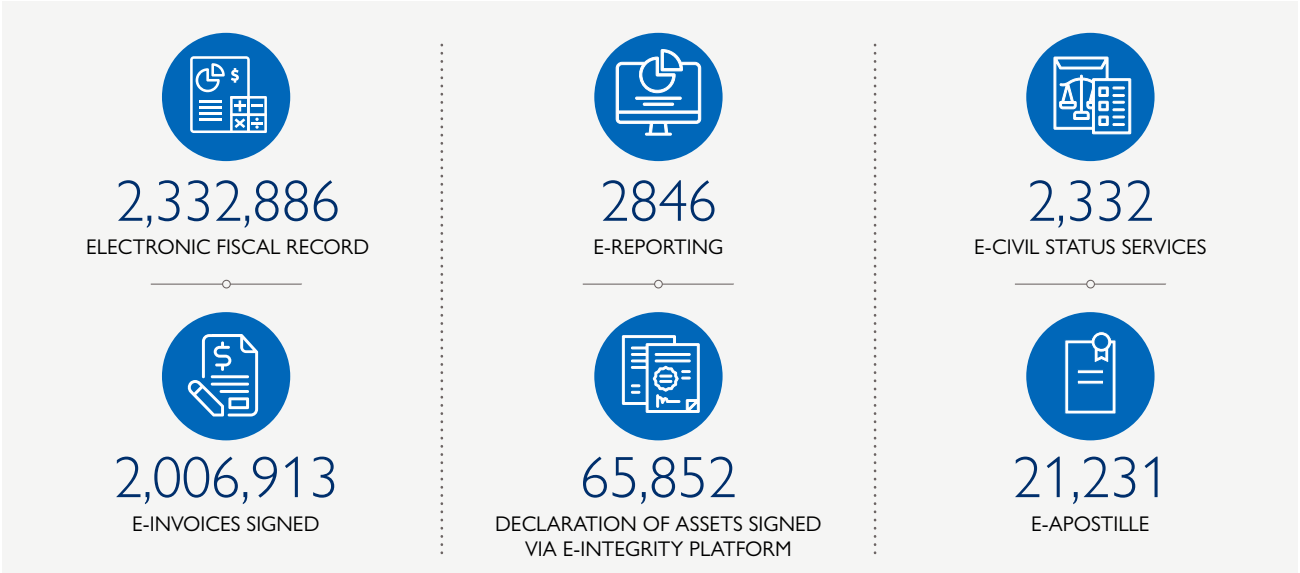
Source: EGA 2021 Annual National Survey

ROBUST CENTRAL GOVERNMENT DIGITAL ARCHITECTURE

Moldova's e-government architecture is comprised of a series of interoperable platforms, including MCloud,[149] MConnect,[150] MLog, MPay,[151] MSign,[152] MPass,[153] MPower, MTender, MNotify, MCabinet, and the public (e)services portal. In brief:

- **MConnect:** a government-to-government (G2G) and government-to-business (G2B) data exchange (interoperability) platform, integrating over 53 public institutions and increasingly the private sector (banks, utilities) in real time.[154], [155] The platform eliminates redundant bureaucracy and enables effective G2G transmission of data.
- **MCloud:** a shared, open-source, WSO2 cloud-based government platform that offers an accessible virtual environment for public institutions to host their information systems, data, and e-services and eliminates redundancy in a secure online environment.[156]
- **MLog:** enables the traceability, security, and ongoing auditing of G2G data exchange transactions in the context of the use of state information systems.[157]
- **Public Services Portal:** a one-stop-shop, recently upgraded, for information on 648 public services provided by the central government and increasingly by local governments.[158]
- **MPay:** a unified payment and invoicing system that allows citizens and businesses to engage with 57 institutions to pay for 644 public services (e.g., school fees, road taxes, patents, utilities, court fees, fines, income tax).
- **MSign:** is a form of digital identifier of a person using a cryptographic SIM card. Moldova was among the first countries in the world to implement electronic Mobile eID/ mobile signature, which was operationalized through an innovative public-private partnership model.[159] In 2013, GSMA awarded the Best mGovernment Award to Moldova's Mobile eID. The virtual ID solution allows users to authenticate themselves in cyberspace and to electronically sign any needed, legally-binding transaction or document. It is simple, mobile-phone based, and no separate card reader or drivers are needed. According to EGA (2019), within the first trimester of its launch, nearly 10 million eSignatures were used. At same time, several DECA stakeholders noted that the adoption of MSign is suboptimal and would be enhanced by connecting it to more existing e-services in order to expand its utility.

FIGURE 16. Public e-services e-signature use



Source: EGA – Infographics (2019)

DATA CENTERS AND MANAGEMENT INFORMATION SYSTEMS (MIS)

In 2014, GoM began to consolidate and host all data on an open source cloud platform (MCloud). The migration process was challenging as not all government authorities were willing to switch to the cloud platform and continued to invest in their own data centers. In 2018, the Information Technology and Cyber Security Service (STISC) was formed through the reorganization of the state enterprise—Special Telecommunications Center— to oversee the consolidation process. STISC was mandated to host and maintain the governmental infrastructure of information networks, data centers, interoperability platform, CCTLD.md, and the Government's technical cybersecurity functions.

Deepening digitalization efforts, in 2020, STISC consolidated hosting of fragmented public data. Phase 1 of a comprehensive baseline inventory of different state departments' information resource systems has been completed, while Phase 2 (restructuring of data centers) is planned to be finalized by the end of 2022. Almost half of more than 100 information systems have begun the migration process; the majority of these were the easier ones to migrate.[XV] Migration of the more complex systems is still outstanding. The latter process is more complicated as many legacy information systems are incompatible with the new cloud-based systems. Another long-term effort, post-data migration, will be to establish effective change management structures and the corresponding definition of roles and responsibilities, including the allocation of relevant expertise and resources.

FUTURE PLANS FOR THE DIGITALIZATION OF PUBLIC SERVICES AT THE CENTRAL LEVEL

With the State Chancellery as the beneficiary and EGA as the lead implementer, the Modernization of Government Services Project–Phase II (MGSP 2018-2023, US$ 22.43 million) is supported by the World Bank. The MGSP assists the GoM in the implementation of Strategy on Public Administration Reform 2016-2021 and its Action Plan on Public Services Modernization Reform 2017-2021. The project aims to improve the accessibility, efficiency, and quality of public administrative services through customer-centered modernization. Since 2013, USAID has supported the rollout of Citizens Information and Service Centers (CISC) for LPAs in Moldova. CISCs are designed to facilitate service provision and provide information to physical and legal entities on the Mayor's Office activities. In extension of CISC, USAID/IREX My Community Project has added E-Cancellaria in 12 pilot LPAs. E-Cancellaria comprises a software solution that facilitates more efficient communication, electronic document exchange and data sharing between LPAs and District level authorities.

EGA is preparing a piloting and subsequent replication scheme for the Universal Service Delivery Centers (CUPS) building on the achievements of and in dialogue with USAID's My Community Project and the MGSP.[XVI] In its pilot rollout, CUPS will target 17 LPAs, five consular offices, and 22 institutional platforms at an estimated cost of 7.5 million Moldovan Leu (410,000 USD). In the initial phase, the plan is to implement 80 CUPS in Moldova and abroad (consular offices) and to reengineer and modernize 85 public services.[160] Enhanced government interoperability through the MConnect platform and other digital tools (e.g., Citizen's Portal, Entrepreneur's Portal currently under development) is planned in tandem—prioritizing services proposed by the Environmental Agency, National Bureau of Statistics, National Health Insurance Company, General Inspectorate of the Border Police, and the Ministry of Defense.[161]

XV Examples of existing MIS: Judiciary Integrated Case Management System supported by USAID/MCC builds the capacity of the judiciary to fight corruption, increase transparency and public access to justice; Intelligent Energy management information system for public buildings in Chisinau supported by UNDP, Sustainable Green Cities project/ Global Environment Facility (GEF); Education Management Information system develops internal data validation procedures, introduction of digital signatures and reporting using existing education statistics to inform ongoing education reforms, supported by World Bank.

XVI CUPs – (Unified Centers for Public Services Delivery) will connect complementary offline access points (offices) to Government administrative services at the local level. The piloting of CUPs is spearheaded by EGA and the MGSP, supported by the World Bank with an allocation of US$4.77 million (2017-2022) for: 1) developing a feasibility study for CUPS; 2) piloting of CUPS through different delivery systems including Novateca libraries, JISBs, post offices, and other access points; 3) evaluating the pilot's results; 4) developing of an institutional framework for CUPS; 5) rollout of CUPS at the national level; 6) establishing a unified call center for citizens, businesses, and government to enable access to information on services and support requests; and 7) the refurbishment of existing facilities that will house CUPS with a consistent look and better conditions for citizens. World Bank MGSP Appraisal Document (2017-2022).

AT THE LOCAL LEVEL, INCREASED DEMAND FOR DIGITALIZATION BY LOCAL PUBLIC AUTHORITIES (LPAS)

Digital maturity and digital literacy among LPAs is mixed. USAID's My Community Project staff estimate that the majority of the LPAs they work with[XVII] are at 50 percent digital maturity to optimally perform their tasks. While LPAs often prioritize physical infrastructure projects such as roads, bridges, and water management systems over ICT, demand for use of digital tools among LPAs is rising as pressure to be more efficient and responsive to citizen queries mounts. Still, many LPAs do not have basic websites and their administration is largely paper-based. Those that are more tech-savvy use WhatsApp, Viber, or social media sites to communicate with their constituents. LPAs' resistance to implementation of digital solutions may stem from their lack of understanding of the benefits of digitalization, a perceived low tolerance for change management processes, and a lack of relevant skills and budgetary constraints.[162]

THE CONCEPT OF ELECTRONIC LPA (E-LPA) CURRENTLY UNDER PREPARATION BY EGA

The implementation plan for Electronic LPA (E-LPA) is being prepared in tandem with CUPS. These two government-driven initiatives constitute an important backbone for the digital transformation of LPAs. Unified or streamlined software solutions for electronic document exchange that are compatible with higher level territorial units (districts, central government) are lacking. E-LPA will ensure that all LPAs attain a basic level of digitalization and acquire digital skills. Currently, several initiatives are being undertaken, but they are reportedly fragmented as different LPAs and donors are implementing their own solutions which are not always fully compatible with each other or with existing or planned central government solutions.

TABLE 2. Missing links related to the provision of e-services

NATIONAL LEVEL	LOCAL LEVEL
• Interviewees reported low usage of e-services by citizens with low public awareness, insufficient user-centric support mechanisms (tutorials, webinars, demos, chat boxes), and scant government promotion of digital services. • A law on public services, which typically defines what constitutes a public service (on or offline) and provides a basis for the establishment of a National Catalog of public services, is not in place. This prevents EGA from establishing a firm diagnostic baseline and comprehensive plan for business process reengineering of strategic public services, e.g., identifying duplication, scope, demand for, and stage of their digitalization.[163]	• Incompatibility between local public administrations (LPAs) and interoperability solutions offered by the central level (e.g., MinFin's budget/expenditures database, cadastre, civic registry) prevents LPAs from direct access to state and line ministry registers, which in turn hampers the efficiency of G2G data exchange and slows service delivery. In some instances where LPAs have access to state registers, it is read-only, which impedes efficiency. • Inadequate ICT equipment in some LPAs, budgetary constraints, and low digital literacy among LPAs and citizens prevent LPAs from achieving scaled digitalization.

XVII USAID's My Community Project works with 77 communities that serve 1.3 million citizens; it trains 800 local civil servants on the use of innovative tools for asset management and managerial control. Thus far, as a result of improved asset management, partner communities have gained $4.2 million in revenue and 87 percent of partner LPAs reported improvement in key capacity areas.

NATIONAL LEVEL	LOCAL LEVEL
• Though EGA reportedly has a vision for the continued selection of digitalization services, a comprehensive strategy is not publicly available. • Despite comprehensive e-government architecture, the existing interoperability system is seen as inadequately integrated with existing G2G systems to optimize and offer add-on services that have expanded utility.[164] • It is unclear how systematically user interface and user experience UX/UI principles are integrated in existing business process reengineering of government e-services; strategy and publicly shared guidelines are not available. • Resistance among line ministries and staff to digitalize services persists.[165]	• Inadequate public administration, decentralization, and territorial reforms (fiscal, administrative) prevent the scale-up of digital transformation efforts at the local level. • Sustainability of digital platforms (beyond piloting) is a challenge as most LPAs and civic entities do not factor in maintenance fees or allocate staff to sustain new digital activities. Most websites developed, hosted, and owned by projects are not always handed over to local authorities properly.[166]

2.2.3 DIGITAL GOVERNMENT: ENABLERS FOR TRANSPARENCY, ACCOUNTABILITY, AND PARTICIPATION

OPPORTUNITIES FOR DIGITAL CIVIC ENGAGEMENT ARE GROWING BUT TWO-WAY INTERACTION IS LOW

Over the past decade, the GoM and State Chancellery launched several digital interactive platforms to increase transparency and to enhance citizen access to information and opportunities to provide feedback to the government. Though certainly seen as positive developments, most stakeholders claim that civic engagement through these platforms is formalistic with a low rate of participation or influence on policy agenda-setting or on decision-making processes. CSO uptake of digital tools for civic mobilization and activism is also limited.[167] While some independent civic initiatives in investigative journalism (e.g., #Kremlinovci),[168] topical campaigns (e.g., Initiativa Pozitiva),[169] and combatting disinformation (e.g., Fake News Lab) exist,[170] they are sporadic and lack critical mass.

LOW INNOVATIVE USE OF DIGITAL TOOLS FOR COLLABORATIVE SOCIAL INNOVATION IN THE PUBLIC DOMAIN

Multi-stakeholder use of ICTs for social innovation and public good is experiencing high growth in the U.S., the EU, and other EAP countries.[XVIII] In Moldova, this sphere is almost invisible. Social innovation is the innovative and collaborative use of ICT where CSOs, public authorities, academia and citizens co-create solutions to diverse social or ecological problems facing our society. Examples of ICT-driven social innovation include ICT-enhanced participatory urban planning, citizen science projects, or the development of more inclusive services. Some novel social innovation examples can be found in Moldova:

XVIII Stanford Graduate School of Business: Center for Social Innovation; Examples: Citizen Labs, Be Responsible Montenegro—a crowdsourcing solution fostering transparency and civic engagement through a mobile app which allows any citizen to report on transgressions ranging from illegal waste dumps and illegal parking to misuse of government-owned vehicles. Results: more than 1,800 civic reports of grey economy were filed by citizens within the first six months, and more than 560,000 EUR in imposed official fines was generated, half of which was reinvested in five social projects that included upgrading of kindergartens and beautification of public spaces.

- **Community Tool Against Corruption** is an anti-corruption platform, launched in April 2019, allowing a civic entity to report incidents of corruption. Since its launch, 96 incidents of corruption have been reported in more than 10 different domains. Voter fraud, violations of legal procedures, and bribery accounted for 75 percent of the cases.[171]
- **LEGATHON: Hack Corruption. Law to the People** was organized in 2019 with the support of UNDP. The hackathon aimed to develop digital solutions for the National Anticorruption Center for combating corruption.[172]

Both initiatives were donor-supported rather than initiated by local CSOs. CSOs are important intermediaries in facilitating ICT adoption in the civic sector and by the greater public. In Moldova, CSO uptake of digital tools for civic activism is passive at present. Collaborative models of governance (based on horizontal rather than hierarchical power structures) among government-CSO-citizens-academia are also new to Moldova.[173]

"Social innovation is the process of developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress. Social innovation is not the prerogative or privilege of any organizational form or legal structure. Solutions often require the active collaboration of constituents across government, business, and the nonprofit world."

ANONYMOUS DECA INTERVIEW WITH ACADEMIC INSTITUTION

ONLINE ACCESS TO INFORMATION HAS IMPROVED BUT FEES IMPOSED BY STATE ENTITIES CAN BE HIGH

Access to public information in Moldova is constitutionally protected (Article 34) and is regulated by law.[174] With the launch of transparency platforms and online feedback mechanisms such as open budgeting, e-petitions,[175] and e-consultations, citizen access to information and opportunities for engagement have increased. However, in practice citizens and civil society frequently face challenges in exercising these rights because government officials often delay the provision of information and justify the refusal to provide data to citizens, civil society, or journalists based on their interpretation of the Law on Personal Data Protection. The law's provisions are too general, it allowing public institutions to interpret and determine the fee amounts charged. Fees imposed for public data provision are often prohibitively expensive, hampering independent journalism and civic advocacy initiatives. A 2020 assessment conducted by Freedom House noted that when institutions fail or refuse to provide information of public interest, they are not penalized for it.[176] Institutions also impose fees on media for accessing information already stored in electronic databases paid for by taxpayer funds.

MOST PARTICIPATORY MECHANISMS SUCH AS E-PETITIONS AND E-CONSULTATIONS ARE FUNCTIONAL BUT REPORTEDLY FORMALISTIC

E-petitions are an electronic means of sharing citizen feedback or grievances rather than mechanisms for collective action and expression of public preferences. Public institutions have inefficient internal processing and accountability procedures and the public generally shows low adoption of e-petition use.[177] Legislation on e-consultations nonexistent in Moldova, and regulations for public consultations are not fully enforced. Since 2012, the GoM has hosted a centralized e-consultation platform where any ministry, state agency,[178]or LPA (including the Chisnau City Council) can launch its consultations. In 2020, 791 public consultations were held. While the platform is well structured and e-consultations are launched, the extent to which e-consultations influence policymaking varies across institutions.[179] Experts note that this is due to the fact that e-consultations are unregulated. Public authorities are not obliged to account for their

consistency (e.g., at specific stages of the policy cycle) in providing feedback on citizen comments, or in taking action on citizen feedback and comments.

PARTICIPATORY LOCAL DEMOCRACY IS INCHOATE BUT PARTICIPATORY BUDGETING IS GAINING TRACTION

Active engagement of CSOs and citizens in local policy and decision-making processes is low throughout Moldova although some innovative approaches have been piloted. In 2016, Balti and Chisinau Municipal Councils adopted local regulations for the implementation of participatory budgeting.[180] USAID's My Community Project and the Inform, enable and act! Civil Society for Better Budgetary Governance in Moldova Project (2019-2022) are working actively to promote and implement participatory budgeting initiatives at the municipal and community level.[181] National law on participatory budgeting is absent and so is the use of online voting in participatory budgeting processes.[182] In 2020 and 2021, the Independent Think-Tank Expert-Group with the Institute for European Policies and Reforms organized the First Annual Forum on Participatory Budgeting in Moldova.

MIXED OPINIONS ABOUT THE EFFECTIVENESS OF THE NATIONAL CENTER FOR PERSONAL DATA PROTECTION

The National Center for Personal Data Protection (NCPDP), founded in 2008, is the national authority mandated to act as an advisory, implementing, and capacity development body on data protection and data privacy issues at the national level and is accountable to Parliament.[183] NCPDP's director is appointed by Parliament, which approves its budget; in 2021, NCPDP's budget was 8.9 million Leu.[184] Most stakeholders interviewed noted that the Center lacks relevant capacity and expertise. So far, NCPDP has interpreted its role as an enforcer of data privacy violations by issuing fines rather than strengthening data protection capacity in the public and private sectors. In December 2021, a new Director and Deputy Director of the NCPDP were appointed.

MOLDOVA'S CURRENT REGULATORY FRAMEWORK ON DATA PROTECTION IS NOT GDPR COMPLIANT

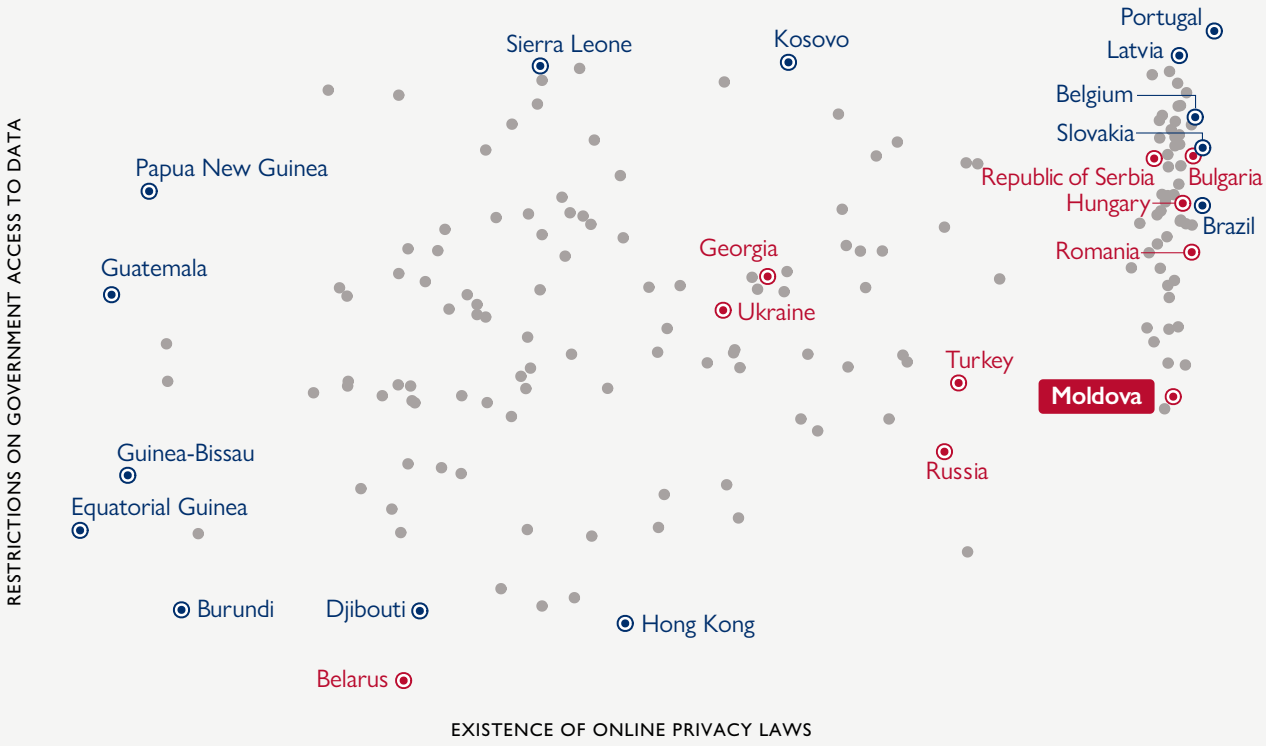
The foundational basis for the right to personal data protection is enshrined in the Constitution of the Republic of Moldova (Article 28)[185]—the right to intimate, family, and private life. Law No. 135 (2017) amending the Electronic Communications Law No. 241-XVI (2007) dedicates a chapter to the protection of confidentiality and guarantees for the right to privacy in the processing of personal data used in electronic communications.[186] Guarantees for data protection are also included in the Moldova Association Agreement (Article 13[1]) with the EU, which calls for "the Parties [to] agree to ensure a high level of personal data protection in accordance with the EU, Council of Europe, international legal instruments and standards". However, EU's GDPR directive has not been fully integrated in Moldova's legislation on data protection (Law No. 133/ 2011).[187] While some sectoral guidelines on data protection—for example in election processes,[188] police, judiciary, education, and health sectors[189]—have been developed by the NCPDP, they are not fully GDPR-compliant, nor are they being implemented[190]due in part to NCPDP's limited expertise, capacity, and resources.

NEW GDPR-COMPLIANT LEGISLATION IS IN THE PROCESS OF BEING DEBATED IN PARLIAMENT

Unsatisfied with the status quo, in 2021, a business-academia-CSO coalition submitted a pro-GDPR compliant reform package on data protection to Parliament. The proposed reforms passed a second Parliamentary reading and are

expected to be adopted in 2022. If approved, the legislation will be a game changer for the adoption and dissemination of GDPR in Moldova. A transitional change management strategy which will affect government, private sector, societal actors, and individuals is yet to be put in place.

FIGURE 17. The state of data privacy in Moldova



Source: Digital Society Project (2021)

Moldova's move toward GDPR alignment puts it in sync with its regional neighbors Bulgaria, Hungary, and Serbia in terms of online privacy laws. However, Moldova is an outlier when it comes to the government's broad access to personal data.

BOX 8. Existing risks related to inadequate prioritization of data protection measures

Private sector: Though the private sector is currently more advanced than the public sector in implementing data protection measures, the February 2015 Starnet ISP data protection incident, which exposed some 140,000 of its clients personal data records, has gone virtually unpunished by authorities.[191] SMEs are also known to lack information, knowhow, and internal rules and procedures on which data they can and cannot publish, and often wrongly publish and process client data.

Education: During the COVID-19 pandemic, the education system's migration online made it vulnerable to cyber threats. E-learning platforms used to administer exams were regularly targeted as they contained personally identifiable data ,and public educational institutions and private individuals applied weak data protection measures. Data and information theft in academia (e.g., seismic data from the Natural Sciences Faculty at the State University) are other examples of increased risks.[192]

BOX 8 (CONTINUED). Existing risks related to inadequate prioritization of data protection measures

Labor related: As more employees work remotely due to the COVID-19 pandemic, increasing data privacy concerns have been raised relating to employees who may be working with sensitive data in their less secure home settings. Such new work modalities may be in breach of data protection principles which have not been legislatively addressed in Moldova.

Health sector: Stakeholders claimed that Ministry of Health and public and private health institutions are neither actively involved nor interested in data protection aspects despite health being a sector with highly sensitive and private personal data. "Data-sharing protocols between the growing number of private clinics and public health institutions are known to be subject to potential data breaches but data breaches are not openly talked about. …data related to the verification of COVID-19 vaccinated/unvaccinated people has also emerged as a problematic area in Moldova".[193]

NO KNOWN DONORS ARE CURRENTLY WORKING ON DATA PROTECTION ISSUES

In 2015-2017 UNDP Moldova had a small project that included Parliamentary oversight on data protection.[194] In 2017-2019, National Center for Data Protection was a beneficiary of another Twinning Project (EUR 1 million),[195] supported by the European Commission, the German Foundation for International Legal Cooperation and the Ministry of Justice of the Republic of Latvia. During 2021-2022, the Moldovan Association of ICT Companies will implement a very small project on improving legislation and advocacy for data protection which will be financed by the American Bar Association in Ukraine.[196]

EARLY DAYS OF DATA-DRIVEN ORGANIZATIONAL CULTURE IN PUBLIC INSTITUTIONS

Effective digital data collection, storage, analysis, and its dissemination are essential to contemporary governance. If designed and used well, open data can improve the efficiency of public administrations and contribute to socioeconomic growth. From 2011 to 2013, Moldova made great strides in adopting an open data culture. In 2012, the GoM adopted Law No. 305 on Open Data and in 2011[197] Government Ordinance No. 43 launched a national open data portal[198] which currently features 1,175 datasets.[199] The National Bureau of Statistics (129 datasets), Ministry of Education (128), Ministries of Health (125), Interior (125), Economy (124) are the top publishers of data, while the Ministries of Agriculture and the State Agency for Tourism are among those with the fewest published datasets. The open data portal features several useful applications and data visualizations. A significant amount of the published data is non-machine readable (in PDF or doc format) and is difficult to use without proper contextualization. How open data are used to foster greater transparency, better policy making and decision-making, or new public services is less evident. Interviewees pointed out that G2G data-sharing culture and usage of data for evidence-based decision-making is low; the concept is not understood among authorities, and skilled staff are lacking. A critical mass of experts outside the government including technologists, developers, and user communities is lacking.[200] In other countries, open data is increasingly used in open budgeting, monitoring of government, economic or civil society performance, geo-referenced visualization of urban planning processes or neighborhood crime, carbon emissions, or in the monitoring of institutional performance in the education and health sectors.[201] Currently, the low-profile open data agenda rests with the National Bureau of Statistics and has been predominantly donor-driven, mostly by UNDP.

BOX 9. Ministry of Finance budget transparency portal

Since 2011, budgetary transparency in Moldova has improved under the BOOST project.[202] The Ministry of Finance (MoF)'s website has been modernized in recent years, and budgetary data is published on the open data portal date.gov.md. In 2019, the MoF launched a budget transparency portal (budget.mf.gov.md) and a series of additional measures to make open budgeting more public-friendly and interactive:

- The budget transparency portal provides clear visualization of budget execution data;
- Citizens' Budget[XIX] has been published annually since 2015, providing a simplified version of the Public Budget, which is published after the Budget Bill is passed each year; and
- There is no legal provision requiring the publication of this document and the MoF outsources this task; there is a plan to institutionalize its publication in-house.[203]

While open data is listed as a priority area in GoM's Open Government Action Plan (2018-2020), stakeholders note that in practice the open data culture in government and in civil society and user communities is nascent.[204] Good practices such as the MoF's open budget portal are noteworthy, but there is room for improvement when it comes to open data capacity and use at all levels of government. Budgetary information on other ministry and government agency websites is often unstructured and difficult to follow, even though the structure of government web pages is regulated. Independent Reporting Mechanism's Transitional Results Report 2019 for the Open Government Action Plan (2018-2020) concluded that "Moldova's overall open data publication practices remain unchanged compared to the previous action plan."[205] It lists inadequate specification of open data standards and activities in various state departments, general legal and practical gaps in access to information—an audit of which was recommended—and the need to improve interfaces with civil society, public, and business user communities (e.g., adoption of open data charter). Meaningful use of published data by civil society and user communities should be enhanced. Among the key hurdles for the adoption of a whole-of-government approach to open data in Moldova is the low understanding of the utility value of open data and relevant skill sets among government authorities.

MTENDER IS A GREAT STEP FOR ENHANCING PROCUREMENT TRANSPARENCY BUT NEEDS END-TO-END DIGITIZATION

In July 2017, Moldova's Parliament adopted key revisions to the law on public procurement and as part of its Association Agreement with the EU, Moldova developed its first Public Procurement System Development Strategy 2016–2020.[206] In its third Open Government Partnership action plan (2016-2018), GoM pledged to open the public procurement process and make public tenders fully transparent on the country's MTender system, which was launched in October 2018. MTender should offer end-to-end oversight of the procurement cycle in real time. According to the Open Contracting Data Standard (OCDS),[207] any civic, public, or private user can retrieve the list of existing OCDs from the MTender public point.[208] MTender has been developed for the most part; its end-to-end digitization has yet to be completed. This means that some segments of the MTender are still paper-based.

In response to the COVID-19 pandemic, GoM issued Decision no.493/2020 on additional transparency measures in public procurement processes related to medicines, vaccines, and various medical goods. Subsequently, Law No. 69/2020 on COVID-19 pandemic emergency measures introduced a series of new restrictions.[209] For example, reduction of

XIX "What is the Citizen's Budget?" n.d. Ministry of Finance. Accessed August 4, 2022. https://mf.gov.md/en/content/what-citizens-budget. Citizens' Budget is prepared by the Ministry of Finance in order to improve public access to budget information and promote accountability and transparency in public finance management. https://mf.gov.md/en/content/what-citizens-budget.

timelines in the open, restricted tendering procedures, and in the request for quotations; raised thresholds for the application of the public procurement law of 2015, and advance payment for public procurement necessary for the prevention and control of the COVID-19 pandemic.

The World Bank's Moldova Assessment of the Public Procurement System (MAPS, 2021) and the stakeholders interviewed concluded that continued digitization of the e-procurement system is an essential for ensuring the integrity of public procurement in Moldova.[210] Interviewees pointed out that at the local government level, most LPAs have budgetary and expertise constraints when it comes to using e-procurement systems. Currently, e-procurement sources are outsourced by LPAs, but there is a lack of quality assurance service providers.[211]

OVERVIEW OF INSTITUTIONAL COMPETENCIES IN ELECTRONIC PROCUREMENT

The Ministry of Finance (MoF) is the main government institution in charge of policy development related to public procurement. The State Treasury (under the MoF) is responsible for registering public contracts and for paying invoices while the Public Procurement Agency (under the MoF) manages and monitors operations of the system but has no power to enforce sanctions or corrective measures. Its monitoring reports are not published regularly according to reports. The National Agency for the Resolution of Complaints reviews and rules on complaints from tenderers. Transparency International, AGER, and IDIS Viitorul act as civil society partners in MTender's oversight. Key donors UNDP and the World Bank support the GoM in strengthening its e-procurement capacity.

THE E-INTEGRITY ASSET DECLARATION SYSTEM

The e-integrity asset declaration system has boosted the fight against corruption since its launch in 2017.[212] Annually, more than 60,000 asset declarations are collected from public servants, processed, published, and archived by the system.[213] Civil society and the recent monitoring review of the system value the National Integrity Authority (NIA)'s efforts to fight against corruption, facilitate investigative journalism, and encourage transparency among public servants.[214] While the information is on a unified platform and in digital PDF format, the processing and publication procedures are still done manually because private information on the declarations must be blurred before publication. This require a massive administrative effort. Transparency International, media, and CSOs have requested that the published declarations be made available in machine-readable formats, which would make corroboration of information much easier. Currently, CSOs and investigative journalists spend extensive amounts of time analyzing cumbersome PDF documents. Resorting to manual, selective blurring of personal information (on asset declaration forms) is one example of efficiency asymmetries within NIA's system. The NIA acknowledged this shortcoming and is looking for software solutions (AI, integrated analytics) from prospective donors to make its processes more efficient. It wants to deepen its analytics, including identifying high risk corrupt individuals.

The Action Against Corruption project (2020-21, budget of USD 250,000) focused on legislative and capacity building activities to enhance GoM's compliance with the Council of Europe's Group of States against Corruption. Recommendations from the project include improving corruption prevention mechanisms, strengthening the capacities and effectiveness of the National Integrity Authority to handle declarations of assets, and supporting in-service training for judges and prosecutors on Professional Code of Conduct and Ethics.

BOX 10. Government response to the 2022 Ukraine refugee crisis caused by the Kremlin's war on Ukraine

Moldova felt the humanitarian effects of Russia's war on Ukraine almost immediately after its outbreak in February 2022. By March 15, 2022 UNHCR reported 300,000 Ukrainian refugees passed through the borders of Moldova, one-third of whom (110,000) decided to stay in Moldova.[215] This has posed unexpected large-scale demand for public services and humanitarian assistance. In swift response, GoM launched an online DOPOMOGA (Help!) platform to provide basic services to Ukrainian refugees including access to: healthcare services, domestic and international transport, housing, psychological support, employment, and national and community hotlines.[216] On March 14, 2022, the Public Services Agency launched a mobile application to issue a state identification number (IDNP) to Ukrainians who choose to stay in Moldova for the long term. The IDNP is integrated with the dopomoga.gov.md platform and enables Ukrainians to officially present themselves to state bodies when seeking public services such as employment, enrolling children in school, opening bank accounts, and registering a company.[217]

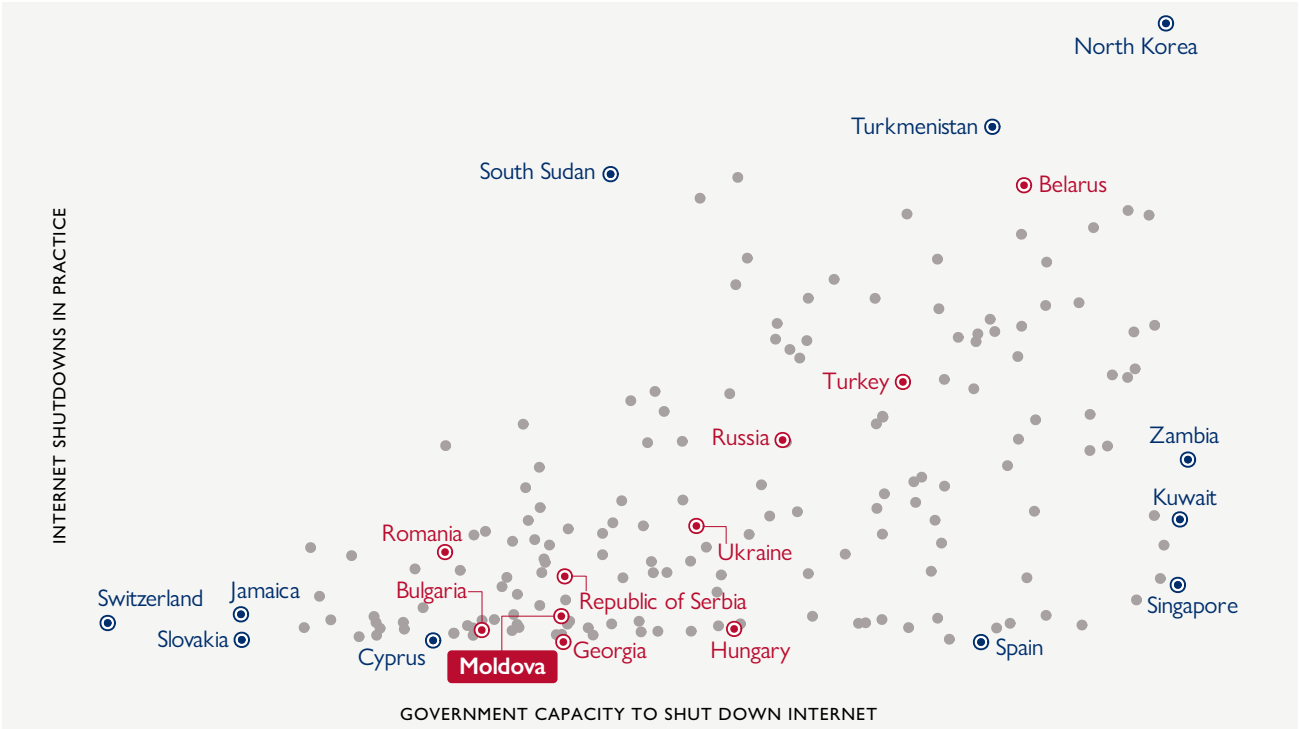
2.2.4 GUARANTEES FOR INTERNET FREEDOM AND DIGITAL RIGHTS

Internet freedom is the "exercise of internationally recognized human rights online, such as freedoms of peaceful assembly and of expression, including the freedom to seek or impart information and ideas of all kinds regardless of frontiers, through any medium. By extension, it also includes the free flow of information that allows economies and societies to thrive."[218] USAID's internet freedom work emphasizes digital security for civil society and media organizations, supports citizen engagement in internet governance, and promotes the recognition of human rights online.[219] While Moldovan citizens enjoy relative freedom from overt digital repression tactics such as censorship, surveillance, and internet shutdowns (see Figures 18 and 19 below), their information space is increasingly polluted by mis- and disinformation. The COVID-19 pandemic and Russia's February 2022 invasion of Ukraine opened the door for increased government control of the digital space.

DIGITAL REPRESSION IS MINIMAL, SO TOO ARE CHECKS AND BALANCES TO PROTECT INTERNET AND MEDIA FREEDOM

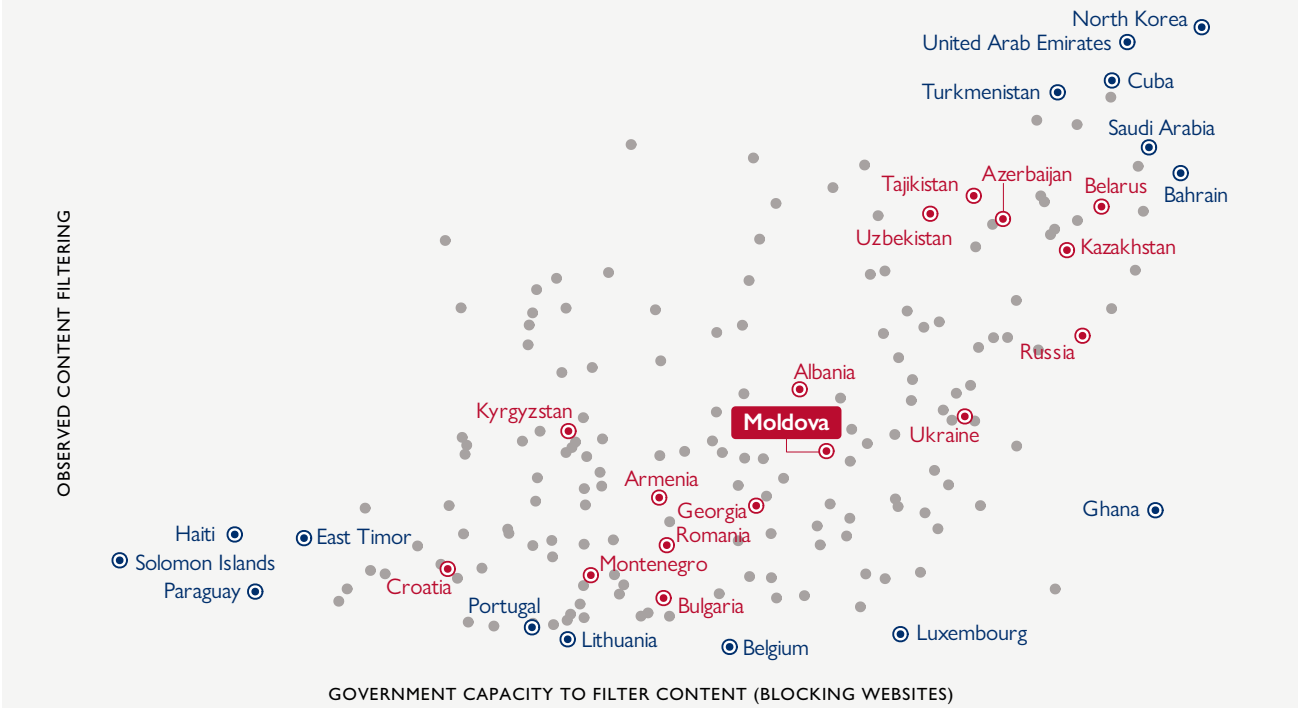
Systemic censorship of online content and network disruptions such as deliberate internet shutdowns by government authorities are key violations of online freedoms. In Moldova, these violations are rare. As shown in Figures 18 and 19 below, the GoM has limited capacity for and limited instances of shutting down the internet and of censoring online content. In comparison to its regional neighbors, Moldova is among the least restrictive countries when it comes to internet shutdowns and online censorship.

FIGURE 18. Government propensity to shut down the internet



Source: Digital Society Project (2021)

FIGURE 19. Government propensity to censor the internet



Source: Digital Society Project (2020)

While the GoM has not committed gross digital rights violations, experts observe that implementation of laws designed to protect citizen's rights and privacy is suboptimal. Checks and balances that prevent authorities from taking a more prohibitive stance in policing internet content are insufficient. This leaves opportunity for government authorities to misinterpret and abuse the legal framework.[220]

EMERGENCY SITUATIONS OPEN SPACE FOR TIGHTENED ONLINE CONTROL

In March 2020, in the wake of the onset of the COVID-19 pandemic, Moldova's Information and Security Service (SIS) unilaterally blocked 52 news sites that were allegedly spreading misinformation and fake news about the COVID-19 pandemic.[221] Civil society actors criticized SIS for making selective decisions because information was not shared about how the blocked websites were chosen. In June 2020, the GoM tripled the time frame (from 15 to 45 days) for responding to freedom of information requests and the Supreme Court of Justice annulled the Law on Access to Information, though this decision was reversed in October 2020.[222] While the high volume of demands on the administration in the early stages of the pandemic was challenging, actions taken by the GoM show a willingness to enact top-down approaches to control online content.

A more recent instance tells the story of a positive government response to criticism, backing away from legal changes that could have been used to threaten internet and media freedom. In April 2022, in response to Russia's war on Ukraine and the proliferation of pro-Russian propaganda in Moldova's online and offline media, Parliament released a draft law to amend certain normative acts on information security. The law mandated that online content providers and television media in Moldova immediately stop the promotion of disinformation and banned Moldovan television from broadcasting news produced in Russia.[223] Authors of fake news would incur fines and sanctions that could include suspensions of television shows and closures of news portals. While the law was presented as an important war-time protective response, opposition parties expressed concern that the law would impose unseen censorship and that it could threaten the sanctity of Moldova's democracy if new leadership with malign interests assumed political power.[224] However, just a month later in May 2022, it was announced that the law would be revised with more specified language and divided into two parts. The first part would ban news broadcasts of an informative-analytical military nature from the Russian Federation. The second part would give powers (yet to be specified) to the SIS to ensure the security of the information space. This part of the revised law will be finalized through consultations with outside actors including the media, the Council of Europe, and civil society. The Vice President of Parliament emphasized that the government wants to ensure that the law strengthens information security, but at the same time [respect] the constitutional rights of citizens, access to information, and the right to independent press.[225]

This is not the first time Russian media content has been banned in Moldova. In 2018, a law was passed that outlawed all Russian news and political broadcasts. This was done in the interest of combatting Russia's increasingly aggressive propaganda and disinformation campaigns.[226] However, the law was canceled two years later (in 2020) by the socialist-led parliamentary majority, claiming restrictions on freedom of expression. These instances point to the potential impact of Russian influence on Moldova's information space, especially its ability to provoke government moves toward a more controlled internet and media.

BOX 11. Launch of an online platform to detect fake news during emergencies

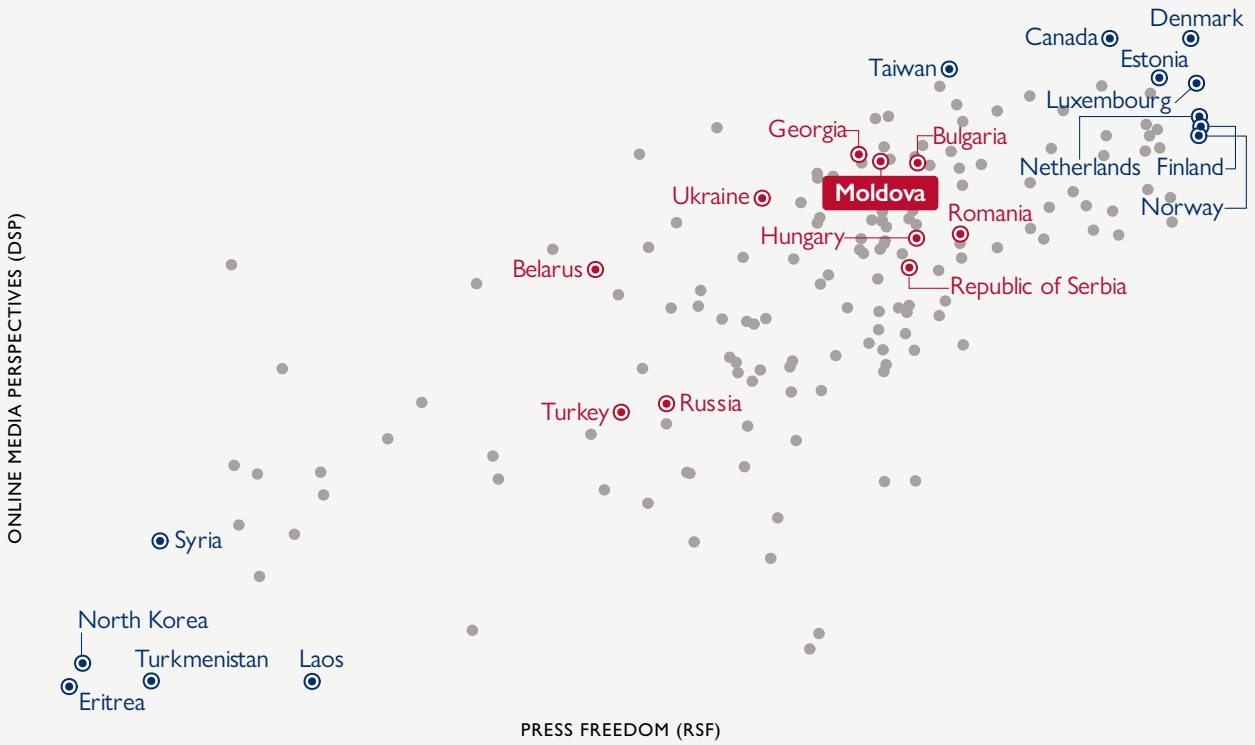
In response to information war spillovers related to the Russian war on Ukraine, a working group was created by Moldova's Department for Emergency Situations, the National Center for Anti-corruption, civil society and the Romanian Government to launch an IT platform that will scan online media content (press, blogs, and social networks) to identify fake news, sources of misinformation, and propaganda.[227]

INCREASED THREATS TO INDEPENDENT MEDIA

In November 2021, the GoM introduced a series of amendments to the Law on the Code of Audiovisual Media Services of the Republic of Moldova. The amendments allow the Director General of TeleRadio-Moldova and the Audiovisual Council to be dismissed by Parliamentary initiative on the grounds of an improper execution or non-execution of his/her duties. Another amendment allows Parliament to dismiss members of the Supervisory Development Board and the Audio Visual Council if it rejects the annual activity report of the Audio Visual Council. Though the latter do not directly relate to online media content, critics and Council of Europe (CoE) see these developments as GoM's move to politicize and interfere with safeguards put in place to ensure an independent media.[228]

Figure 20 below shows that Moldova is about on par with Ukraine, Georgia, Hungary, Serbia, and Ukraine. All are classified by Freedom House as "transition/hybrid".[229] Moldova scored well above the more authoritarian regimes of Belarus, Russia, and Turkey. Almost all countries in the region suffer from higher fractionalization than consolidated democracies in Europe. This could be an effect of Russia's influence on the media and a sign that there is opportunity for exploitation by Russia or other actors.

FIGURE 20. Freedom of Press in Moldova[230]



Sources: Digital Society Project (2021), Reporters without borders (2021)

POTENTIAL PROGRESS TO BE MADE FROM THE INTERNET GOVERNANCE FORUM

In 2005, the United Nations-sponsored World Summit on the Information Society provided an expansive definition of internet governance: "the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet."[231] Internet governance includes topics such as internet identifier management,

information-sharing, coordinated malware analysis and incident response, standard design and adherence, and domain management. The growth of the internet as a global, decentralized system has favored a multi-stakeholder approach, often operating through a combination of global and country-level fora.

he Internet Governance Forum is an example of a globally accepted multi-stakeholder approach[XX] for which Moldova supported a national initiative for the first time in 2020.[232] This is a positive step to raising awareness and promoting a multi-stakeholder approach to internet governance. The first Moldova Internet Governance Forum (MIGF) was attended by some 200 delegates from government, civil society, the private sector, and academia.[233] The second MIGF was held on October 19, 2021.[234]

DONOR SUPPORT TARGETS GENERAL MEDIA LITERACY BUT IS INSUFFICIENTLY FOCUSED ON DIGITAL RIGHTS

The USAID-funded Media-M project and the Digital Rights Literacy Program (USD 16,884)[235] implemented by the Legal Resources Center from Moldova (LRCM) provides support to strengthen general online media and information literacy.[236] However, interviewees noted that insufficient support is channeled to raising awareness among journalists, CSOs, and citizens on evolving topics linked to emerging technologies as well as to digital rights and freedoms. USAID's MEDIACOR Program[XXI] is partly linked to digital media, although it is in early stages.

RISING DIVERSITY IN MIS- AND DISINFORMATION

Independent media interviewees pointed out that fake news and propaganda is worsening and diversifying as are their sources.[237] The groups which are most susceptible to manipulation through mass media are ethnic (Russian-speaking) minorities that must consume Russian media products, Orthodox churchgoers, and the elderly in rural areas. These groups are also likely to have low media literacy and less awareness about their digital rights.[238] The increased use of the internet and social media during the COVID-19 pandemic and high profile political events such as the 2019 Parliamentary and 2020 Presidential elections precipitated the dissemination of fake news and disinformation campaigns.[XXII] Allegedly copying a Russian trolling tactic called "false amplification," the trolls worked with legitimate accounts in Moldova to flood local web forums with manipulative content to influence online pre-election debates.[239] Though misinformation websites are difficult to spot in Moldova, StopFals, a USAID-funded platform run by the Association of Independent Press (Asociația Presei Independente, API) has identified 47 misinformation websites since 2020.[240] Domestic and external entities often hire and pay trolls or press mercenaries to write fake news stories.[241] Moldovan politicians also spread propaganda, most often through social media.[242, 243]

XX "The IGF is a global multistakeholder platform that facilitates the discussion of public policy issues pertaining to the Internet." n.d. Internet Governance Forum. Accessed August 4, 2022. https://www.intgovforum.org/multilingual/.

XXI Establishing the first digital-media production center by applying new technologies, MEDIACOR is supported by the U.S. Embassy, USAID, governments of Sweden and the UK, Moldova's Ministry of Education and Research, Ministry of Culture, the State University of Moldova, and the Moldovan COR Association. The project's total budget is USD 3 million, of which USD 1.3 million is provided by USAID, Sweden, and UK aid. "MEDIACOR digital-media production centre uinaugurated at Moldovan State University." 2021. Moldpres. https://www.moldpres.md/en/news/2021/11/17/21008765.

XXII Prior to the 2019 parliamentary elections, Facebook removed 168 Facebook accounts, 28 Facebook pages, and eight Instagram accounts active in the country, for engaging in "coordinated inauthentic behavior," specifically spreading fake and manipulative information. Facebook attributed some of the inauthentic activity to Moldovan government employees. "Concern over Moldova Cyber Security As Election Looms." 2020. Balkan Insight. https://balkaninsight.com/2020/10/28/concern-over-moldova-cyber-security-as-election-looms/.

RUSSIAN PROPAGANDA SATURATES AND INFLUENCES THE COUNTRY'S INFORMATION SPACE

Russian is widely spoken and understood in Moldova, so Moldovans are highly susceptible to Russian propaganda disseminated via Russian mass media channels and through online outlets such as the Russian satellite Sputnik.md website.[244] With the onset of the Russian war against Ukraine in February 2022, spikes in pervasive Russian propaganda and motivated anti-Ukrainian and pro-Russian disinformation campaigns were apparent in Moldova.[245]

KEY TERMS | BOX 5. Misinformation, disinformation, and malinformation

Misinformation refers to false or inaccurate information, such as rumors and hoaxes. Social media platforms are regularly used to spread misinformation.

Disinformation is defined as false information spread with the specific intent to deceive, manipulate, or influence behavior. It differs from misinformation because it requires malign intent.

Malinformation refers to the deliberate publication of private information for personal or corporate rather than public interest, characterized by modification of context, date, or time of the original content.

MEDIA LITERACY IN DETECTING FAKE NEWS AND MISINFORMATION IS SLOWLY IMPROVING

Though Moldova is vulnerable to frequent disinformation campaigns, according to the 2021 USAID National Study on Moldovans' Perceptions of the Media and Media Skills, 65 percent of respondents reported that they know what fake news is and 44 percent were familiar with the term "media propaganda."[246] Fifty-nine percent of respondents felt confident that they can easily spot when media sources are manipulative or when they are lying, while 31 percent find it easy to tell fake news from true news. The ability to know which authority to turn to has improved since 2018 when 41 percent reported not knowing where to report false or offensive news in comparison to 14 percent in 2020.[247] At the same time, the general public's multidimensional capacity to think critically about online content remains a concern for media experts.[248]

LOW DIGITAL SKILLS AMONG JOURNALISTS AND CSOS AND SUBOPTIMAL USE OF DIGITAL TOOLS FOR DEMOCRATIC DIVIDENDS

Media expert interviewees acknowledged that digital skills and awareness among journalists, civil society, and the general public is low. For the most part, there is low usage of new tech in democratic processes. This is largely due to "the low awareness about the importance of and effective use of new technologies in the media sector. Overall, digital maturity among journalists, CSOs and citizens is elementary and unfit for the contemporary needs of effectively functioning in new, tech-enabled media spaces."[249] Active CSOs such as RISE Moldova, watchdog.md, and StopFals, and online campaigns like Just Test[250] by Initiativa Pozitiva,[251] or the counter-campaign to identify and debunk fake news during the 2020 election are too few in number.[252] An independent community of bloggers, social influencers, and alternative voices is too small.[253] Most civic campaigns are reactive and not adequately proactive in informing and engaging the public in democratic processes or in holding the government to account.

2.3 PILLAR 3: DIGITAL ECONOMY

Digital economy explores the role digital technology plays in increasing economic opportunity and efficiency, trade and competitiveness, and global economic integration. Areas of inquiry include digital financial services (credit or debit cards, payment apps, mobile money, and digital savings and loan products), financial inclusion, regulation of digital finance, digital trade, e-commerce, and the financial technology (FinTech) enabling environment. This pillar also assesses strengths and weaknesses in the local digital talent pool and the tech startup environment. A healthy digital economy requires a supply of ICT skills that match the demand and an ecosystem that promotes technological innovation.

DIGITAL ECONOMY

KEY TAKEAWAYS

- The growing ICT sector and the digitalizing economy are creating demand for technically skilled talent, but a persistent skills gap could affect the pace and wide-scale impact of Moldova's digitalization.
- The startup ecosystem is too nascent to be self-sustaining.
- The government is working to address barriers to e-commerce growth, but local sellers (MSMEs) are slow to move online and digital inclusion in rural areas is limited.
- A lack of data and focus on financial inclusion in Moldova hinders the growth of e-commerce.

RELEVANT RECOMMENDATIONS

- Use innovative approaches to attract and retain technical talent
- Strengthen and expand the innovation ecosystem by attracting qualified talent and increasing the inflow of capital
- Expand the focus on financial inclusion, especially the digital kind, by supporting research and innovation, enabling FinTechs, and digitalizing remittances
- Strengthen e-commerce infrastructure to support growth and integration, and focus on rural market development

INTRODUCTION

The ICT sector in Moldova has recently seen exponential growth and has become one of the most dynamic and competitive sectors of the economy. The volume of ICT exports has doubled over the past five years, and experienced a hundred fold increase since 2006. [254] The ICT sector generates about 7 percent of the country's GDP, approaching a total value of revenues of some $900 million.[255] ICT exports were valued at $300 million in 2021, a 23 percent increase from 2019, and a hundredfold growth from 2006. ICT services make up the majority of these exports, making software development and testing a key ICT subsector.[256] Moldovan companies export some 80 percent of their total production in software development and testing to countries like Romania, the UK, and the US.[257] Moldova has had a positive trade balance in ICT services for the last two decades.[258]

The rapid growth of the ICT sector has been driven by several factors that position Moldova as a key outsourcing destination for ICT services. This includes the low cost of labor and the country's near-shoring location in Europe, which provide both cost and quality advantages.[259] Moldova's advantageous tax regime, offers a unified tax incentive for technology companies, attracting significant investment in the sector and supporting the growth of technology companies.[260]

Apart from the growing ICT sector, key sectors are starting to digitalize, including financial services, healthcare, light manufacturing, tourism, and the public sector. The COVID-19 pandemic accelerated digitalization, as both businesses and government had to move online to continue their operations during lockdowns.

The growth of the ICT sector and the broader digitalization of the economy are receiving ample support from the Government of Moldova, as well as the donor community, positioning digitalization as a critical enabler of social and economic development and as a significant contributor to job creation. The government appointed a dedicated Deputy Prime Minister of Digitalization in 2021 to develop and implement a digital transformation strategy, and coordinate donor efforts in this area. Donors like USAID/Moldova have set up an IT Park, technology hubs like Tekwill, and associations such as the Moldova Association of ICT Companies (ATIC), all of which have contributed significantly to the growth of the sector.

Moldova faces significant challenges that could impede digitalization of the economy and the growth of the ICT sector if not addressed. Most significantly, the country is plagued by a persistent skills gap, as many technically skilled Moldovans go abroad to work, given the quickly rising demand for their skills in European Union (EU) countries and beyond. Moldova's innovation ecosystem is relatively new and too small to be self-sustaining. This limits the number of local technology companies that can support digitalization and ICT sector growth. The digitization of commerce is negatively impacted by slow adoption among micro-, small and medium enterprises (MSMEs) and the low uptake of digital financial services.

2.3.1 THE PERSISTENT SKILLS GAP

JOB CREATION IN THE ICT SECTOR

The ICT sector currently employs close to 30,000 individuals, most of whom are youth.[261] Employment in the sector has undergone a 140 percent growth rate over the past five years.[262] One of the key reasons this sector is attracting such talent is related to high levels of compensation. The average salary for an ICT worker is $1,550 per month, which is four times the country average.[263] According to the World Bank, there is potential for technically skilled employment to triple over the next decade if infrastructure, the business climate, and skills training programs keep up.[264]

Local initiatives like IT Park have contributed significantly to ICT sector growth and job creation. Founded in 2018, the IT Park provides a Silicon Valley-type working environment and currently houses close to 70 percent of Moldova's ICT companies.[265] This represents more than 1,000 ICT companies.[266] These companies are incentivized with a 7 percent tax rate which includes corporate income tax, payroll taxes, and road and property taxes. These incentives have led many to emerge from the shadow economy to formally participate in the Moldovan economy.[267] They have also contributed to the rapid growth of technology companies, which has translated to significant job creation.[268] Over 14,500 jobs have been created since IT Park's inception in 2018.[269]

THE GROWING DEMAND FOR TECHNICALLY SKILLED TALENT

The growth of the ICT sector and the sector's potential for job creation is hindered by a persistent and rapidly growing skills gap. Every year, the IT industry needs more than 4,000 technically skilled graduates, but universities can only produce 2,000.[270] The gap has been widening over the last decade, and both public and private sector institutions across Moldova face severe challenges in hiring technically skilled talent. Moldova's E-Governance Agency (EGA), which is undergoing a process of rapid and wide scale digitization of public services, noted an urgent need for technical talent to support this process. EGA explained that they are in a fight for talent with the private sector, which offers higher salaries and better incentives.[271]

The private sector also noted that attracting and retaining technical talent was among their biggest challenges, and both large and small companies devised strategies to address hiring issues. Mobile network operator Moldcell worked closely with local universities to attract recent graduates and developed structured programming to train these graduates and quickly position them in vacant roles.[272] Startups are experimenting with hybrid incentive schemes to attract technical talent where salaries are coupled with partial ownership of the company (equity). Despite these efforts, many technically skilled graduates still choose to go abroad.

OUTWARD MIGRATION

Outward migration adversely affects the local supply of technically skilled talent. Close to two percent of working age Moldovans leave the country every year to find work abroad.[273] Both government and private sector stakeholders confirmed that technically skilled talent is especially likely to leave and pursue opportunities abroad in neighboring Romania and other EU countries. Work opportunities in these markets provide higher salaries, better living standards, and greater opportunities for career advancement.

It is expected that such demand for technical talent will increase over the coming decade as the shortage of skilled talent is not just a Moldovan problem, but it is also an EU and global problem. Currently, very few initiatives in the market focus explicitly on incentivizing technical talent to remain at home. The Moldova IT Park model increased the retention rates of ICT professionals in the country, but additional efforts are needed to meet the rapidly growing local demand for technically skilled talent.

BOX 12. The global ICT talent shortage explained

The current global talent shortage is at 38 percent or 200 million people with the top 10 hardest to fill positions in the field of STEM. 274 In the EU, the talent shortage is expected to grow exponentially over the next decade. By 2030, the EU will need 20 million ICT specialists.[275]

LOCAL INITIATIVES TO INCREASE TALENT POOL

Several local initiatives work to attract foreign ICT talent into the country, given outbound migration trends. The IT Park worked in conjunction with the government to introduce a foreign worker visa to allow resident technology companies to fill their talent gaps by inviting technical talent from abroad. So far, more than 100 workers have used this visa to come to Moldova from numerous countries including regional neighbors like Romania, Russia, and Ukraine. A majority of these workers are managers and investors, with only a small representation of technically skilled talent.[276] The IT Park Director, Natalia Dontu, noted that there is room to develop dedicated programming that increases the domestic talent pool, especially with the shift toward hybrid and remote ways of working, which could provide new opportunities for Moldovan companies to tap into the global ICT workforce.[277] It is unclear what the government's plans are for the IT visa which is set to expire in 2026.

THE REFUGEE CRISIS: AN INFLUX OF TALENT

As of March 2022, more than 342,000 refugees have entered Moldova from Ukraine as a result of the Russian invasion. Since that time, some 243,000 refugees have left for Romania and more than 96,000 have remained in Moldova.[278] Many migrants are transient and use Moldova as a stopover point on their journey to Romania and other EU countries.

The government of Moldova has already extended the IT visa to technically skilled Ukrainians to encourage them to stay and fill the many technical vacancies in Moldova. This temporary decision was approved by the Commission for Exceptional Situations, but the general legal framework enabling relocation of IT and digital industries and professionals to Moldova is being discussed with donors.[279]

TECHNICAL AND VOCATIONAL TRAINING

Moldova's government reorganized its system of technical and vocational training (TVET) and introduced ICT skills training programs.[280] Graduating students have the option to enroll in technical programs at the college or university level. USAID's Moldova Competitiveness Program supported TVETs across the country in integration of Cisco IT Essential Courses into their existing programming, aiming to strengthen the curriculum. Graduating students have the option of undertaking an additional two-year course to become Cisco-certified. Many TVET graduates leave the country to seek opportunities abroad.[281]

PIPELINE ISSUES AT UNIVERSITIES

More than 18 higher education institutions in Moldova currently provide ICT-focused training. These institutions produce around 2,000 technically skilled graduates annually, who enter the workforce both in Moldova and abroad.[282] Over the past decade, these universities have seen a severe decline in the student population. A University Rector from the Academy of Economic Studies explained that a decade ago, more than 130,000 students entered the university system in Moldova. Today this has dwindled to 50,000.[283] This rapid decline is one aspect of outward migration. Many students choose to pursue their university degrees in Romania, which provides an entry point into the EU labor market. This means that the local labor market is losing critical talent to neighboring countries, even before such talent enters formal tertiary education.

EXPERTS MISSING IN THE CLASSROOM

Apart from decreasing students, official statistics show that Moldova is experiencing a decrease in the number of educational institutions and teaching staff. Over the last decade, the total number of educational institutions decreased by nearly 20 percent; private universities were most affected.[284] Teaching staff also decreased by 25 percent as many educators have moved abroad to pursue teaching roles or have entered the private sector. The decrease in students resulted in overall budgetary cuts at the university level and affected incentives that universities are able to provide teaching staff, which has made it increasingly difficult for academia to retain talent. This problem is persistent in ICT departments, as the Rector of Moldova Technical University explained below.[285]

"An assistant professor earns the equivalent of 350 Euros per month at the university. They can make over triple that amount working in the ICT sector…Soon, there will be nobody left to teach."

– ANONYMOUS DECA INTERVIEW WITH ACADEMIC INSTITUTION

Due to low salaries and incentives within academia, many young ICT graduates decide not to pursue postgraduate studies, and instead enter the private sector where the demand for their skills continues to grow. The teaching staff that remain in the classroom often have limited industry experience, and are not up to date with the technical skills required by industry. As a result, many university graduates are not well prepared.

LOCAL INITIATIVES TO INCREASE THE QUALITY OF TALENT

USAID/Moldova-funded programs like the Future Technologies Activity (FTA) are partnering with international universities like University of California, Berkeley to strengthen and expand existing curricula to improve the quality of graduates. The partnership will work with universities to develop and introduce cutting-edge courses and degrees in areas such as data science. New bachelor's degree programs will be developed in digital media, gaming, design, and animation. The program will facilitate a learning exchange in which Moldovan professors visit US universities and specialized teaching staff support teaching in Moldova. According to Doina Nistor, the head of FTA, the outward migration from Moldova will likely continue in the future, thus talent-focused initiatives should ensure that existing talent is high quality which will improve the country's overall ICT sector competitiveness.[286]

THE EDUCATION CODE

Interviews with university representatives revealed other barriers that affect the ability of universities to place qualified teaching staff in the classroom, including the Education Code (2014). The code stipulates that only individuals with PhDs are permitted to teach at the university level. This prevents professionals with industry experience and relevant skills from taking up part-time or permanent teaching roles. Public university representatives also spoke of significant delays related to introducing new degrees. Government approval processes are lengthy and it can take up to two years to introduce a new course or to update an existing course. This makes it difficult for coursework to be industry-relevant and for students to graduate with the skills needed to thrive in the workforce. This issue of delays is currently being addressed by the government, as part of a broader agenda to meet market demand for specific and relevant skills.[287]

THE GENDER GAP

There is a significant gender gap related to female students entering university to pursue technical degrees. The Rector of the Academy of Economic Studies reported that only 30 percent of students in the ICT faculty are women.[288] University representatives noted that the gender gap starts at the secondary level, when most girls decide to pursue humanities subjects over STEM, thus making it more challenging to pursue technical degrees. The proportion of women teaching STEM courses at the secondary level is also significantly lower than that of men teaching STEM courses at this level.

According to the UNDP, women occupy only 31 percent of jobs in the Moldovan ICT sector and only 19 percent of overall digital professions. Even when women do enter the sector, there are serious imbalances. Salaries for women tend to be 33 percent lower than those of men.[289] Several development partners, including USAID/Moldova, UN Women, UNDP and the EU have designed programs to address this gap using scholarships and other incentives to attract more females into STEM, and to increase the share of women in the ICT sector. This includes programs such as Girls in IT run by Tekwill, which has trained over 1,000 young women in the IT field.[290]

ENTREPRENEURSHIP TRAINING

Apart from developing technical talent, there are also several initiatives to develop entrepreneurship at all levels of the education system. The Ministry of Education developed an action plan for integrating entrepreneurship education at the primary and secondary levels. Universities from across Moldova have been developing curricula and forming partnerships with the private sector and donor-funded organizations to increase the quality of their entrepreneurship training programs. Tekwill partnered with the Technical University of Moldova to integrate a dedicated course on entrepreneurship into the curriculum of universities that administer ICT degrees. The course is being piloted in universities in Chisinau, Balti, Comrat, and Cahul. The aim is to provide technical graduates with the skills and knowledge to develop and scale technology ventures.

THE UNINTENDED CONSEQUENCES OF ICT CENTRICITY

Over the past decade, the effort put forward by the government and donors to develop the ICT sector led to impressive sectoral growth and job creation. However, such growth caused severe deficits in other areas. University representatives explained that enrollment in ICT programs rose sharply in recent years, but at the expense of severe declines in other STEM areas, including math and physics. This resulted in fewer math and physics teachers in school classrooms, which affected the number of students pursuing STEM studies, and shrunk the pipeline of students pursuing ICT degrees. The representatives also spoke of growing deficits in key professions like physicists, engineers, and scientists, and noted that these deficits must be measured and addressed.

THE TWO-TRACK SYSTEM

Changes introduced by the Ministry of Education may have negatively affected the number of high school graduates pursuing technical degrees. According to several informants working in Moldovan universities, the government reformed high school education to provide students with two distinct paths to pursue—one focused on humanities and the other on math and sciences. This two-track system pushed many students into humanities too early in their education, and decreased the pool of potential candidates of math and science students who tend to pursue technical education at the university level. Many rural schools with smaller classrooms chose to offer only one track–the humanities–to simplify the delivery of education. Several representatives from local universities noted that the two-track system must be revisited in an effort to increase the number of students pursuing ICT degrees.

DIGITAL SKILLS IN SCHOOLS

The government has undertaken several reforms to modernize the education sector and address the persistent digital skills gap in Moldova. These reforms have resulted in initiatives that mainstream digital technologies at all levels of the education system. The Ministry of Education updated the national curriculum in 2020 to include mandatory courses that build the basic digital skills of students at the primary and secondary levels. USAID/Moldova partnered with the government to design and test programs that prepare teachers and students for the future of work under the Tekwill in Every School and the Future Classroom Project. To date, the programs have reached 200 schools, 30,000 students, and 20,000 teachers.[291] The Ministry of Education confirmed that these programs have been highly successful and that additional resources are critical to scaling them up, and ensuring that they reach rural communities where penetration is the weakest.[292] Gaps related to the provision of hardware must be closed to ensure that schools have the equipment needed to teach digital skills in the classroom. [293]

THE IMPACT OF THE COVID-19 PANDEMIC ON THE DIGITALIZATION OF SCHOOLS

Technology became increasingly important to the education sector in early 2020, when Moldovan authorities closed all schools in response to the COVID-19 pandemic. Closures kept more than 400,000 students at home and schools scrambled to set up structures to facilitate remote learning. Technology was pivotal in supporting remote learning, and school closures accelerated adoption.[294] Despite the rapid adoption, significant challenges to integrate technology into schools remain. Many schools lack internet connectivity and computer equipment.[295] Teachers need further training and upskilling to be able to teach, and a set of standards must be developed to support the high quality of content and pedagogy.[296]

2.3.2 A TECH STARTUP ECOSYSTEM IN EARLY STAGES OF DEVELOPMENT

THE STARTUP GAP

Several interviewees from the startup community noted that there are significant pipeline issues when it comes to technology startups in Moldova.[297] There are too few startups in the market and those that do exist have seen limited traction and have very high failure rates, with more than 90 percent failing in their first year of business.[298] Such high failure rates are backed by EU data which shows that only a very small proportion (.05 percent) of Moldovan entrepreneurs build a company that is ready for pre-seed funding[299]. This ratio of conversion is 20 percent lower than in neighboring East-Central European countries including Lithuania, Bulgaria, Estonia, Lithuania, Poland, and Romania. [300]

Moldova's struggling startup ecosystem ranks 77 out of 100 according to StartUpBlink, dropping 13 spots since 2020.[301] According to StartUpBlink, this decline is due to the fact that Moldova has only one city with a robust and active startup ecosystem—the capital, Chisinau. Other factors such as outward migration could also be a major factor in the drop in Moldova's ranking. Efforts are underway to expand the innovation ecosystem to other areas across the country such as Balti (North) and Cahul (South). In both cities, a regional innovation hub is being set-up by donors such as USAID/Moldova and UNDP, in partnership with the government, to develop the regions economically.

CAPITAL CONSTRAINTS

One of the key reasons for high failure rates noted by interviewees is related to challenges in obtaining capital. Most entrepreneurs in Moldova cannot raise capital from investors and have had trouble getting loans from a bank, especially at the early stage of building their businesses. To survive, they self-fund or raise money from friends and family.

The key reason for difficulty in obtaining funding is the lack of local investors in Moldova. According to an EU country assessment, few angel investors and no local venture capital (VC) funds in Moldova have active investments in the ICT sector, or investments in companies in the innovation ecosystem.[302] As a result, all of the technology companies interviewed which were at a growth phase had to raise capital abroad. To do so, they registered their company outside Moldova to connect with and attract more investors.

KEY TERMS | BOX 6. Angel investors versus venture capital investors

Angel investors, or angels, are individuals who offer promising startup companies funding in exchange for a piece of the business, usually in the form of equity or convertible debt. Angels usually invest in businesses at an early stage, when other investors are not prepared to back them.

Venture capitalists (VCs) are private equity investors that invest in startups with high growth potential. They typically invest in companies at a later stage, after the startup has shown some initial traction, and proven that there is demand for the product or service.

Moldova is not well known in the international investment community, thus the need to register abroad. The small size of the market deters investors, unless there is a presence in larger markets that can support rapid growth. The country's population of 2.6 million is declining every year, and represents a small portion (0.5 percent) of the overall European market (748 million).[303]

There is a small, but growing cluster of angel investors in Moldova, supported by a network aggregator called the Business Angels Moldova which has attracted 20 investors since its inception. Over the last year, this network made eight investments averaging around $10,000 per company.[304] The network provided training to help investors identify deals, support the valuation of the companies, and negotiate the terms of investment with the founders.

MENTORSHIP CONSTRAINTS

Apart from access to capital, technology companies and innovation ecosystem supporters noted other challenges such as difficulty accessing mentorship, expertise, and relevant industry connections. Due to the relative newness of the innovation ecosystem and the limited number of startups, a limited pool of founders have built successful startups and thus have the experience and knowledge to effectively support founding teams at an early stage. Existing programs such as Startup Moldova plan to expand the network of qualified mentors by tapping into the diaspora community and forming partnerships with accelerator programs outside of Moldova that offer a rich and experienced network of mentors.[305]

REGULATORY GAPS

Apart from finding companies that are investment ready, business angels also have to find creative ways to structure investment deals. This is because there is a lack of legal framework in Moldova to support and protect investors. Investors who put money into a business become co-founders by law, no matter the size of the investment. There is no crowdfunding law to help Moldovans raise capital, although existing angels have found creative workarounds to invest in business, according to several stakeholders interviewed. Addressing regulatory gaps is important to attract both local and foreign investment.[306]

OTHER CHALLENGES

Many startups noted that large private sector companies are not willing to partner with early stage startups. There are few business incubation and acceleration programs in Moldova to provide the necessary long-term and dedicated support to help guide and sustain early stage startups. There is also a severe lack of coordination among existing programs that support startups, resulting in piecemeal efforts, and possible duplication of efforts and resources.[307] Interviews revealed that closing a startup business is time-consuming and administratively burdensome, requiring significant paperwork and verification of tax and debt payments, which sometimes discourages founders from re-entering the market with a new business idea.[308]

GOVERNMENT FUNDING

The Ministry of Economy is setting up a dedicated program to support digitalization activities and new business formation with a special focus on technology startups. The program will be managed by the Organization for the Development of Small and Medium Enterprises (ODIMM), a public institution that supports the growth of MSMEs.[309] This program is meant to expand ODIMM activities in 2022, with some 60 million Leu ($3.3 million) allocated to support startups with additional funds dedicated to tech startups. It is unclear how much technology startups will benefit from this new program. USAID/Moldova's FTA is partnering with the Ministry of Economy to set up a digital innovation support program with ODIMM that aims to stimulate digitally-centric innovation and support the earliest stage of a technology startup's growth.[310] The impact of these programs on the innovation ecosystem is not clear.

DONOR PROGRAMMING

USAID's implementing partner, Tekwill, develops entrepreneurial talent in the technology space by providing office space and covering some of the mentoring and operational costs for technology startups. Tekwill started an accelerator program in partnership with a private equity firm that provides access to capital through convertible notes. This program hosts around 20 companies a year, but reports suggest that very few startups generated sales after completing the program.[311] In 2021, Tekwill introduced Startup Moldova, a dedicated program which aims to develop the innovation ecosystem and increase the number and quality of technology startups in Moldova. The program is in its early stages, and has ambitious plans to bring high quality mentors into the innovation ecosystem, and create companies that disrupt key sectors and verticals and offer valuable solutions to both domestic and international markets.[312]

2.3.3 DIGITAL FINANCIAL SERVICES: A MISSING AGENDA

THE DATA GAP

There is a substantial gap related to financial inclusion data in Moldova. Although the National Bank of Moldova (NBM) has a robust dataset related to card payments, there is a gap related to other key financial inclusion indicators including:

- Uptake and usage of financial services, geographic and demographic distribution of users;
- Uptake and usage of DFS products: e-money, digital credit, digital insurance, geographic and demographic distribution of users; and
- Key challenges related to the uptake and usage of DFS, especially among excluded segments.

Local estimates of financial inclusion rates varied. Several FinTechs estimated that just over half of Moldovans are financially included.[313] An interview with Moldova's largest commercial bank, Moldova Agroindbank (MAIB), estimated the rate at 80 percent.

Data from the World Bank's Findex is outdated, but shows significant growth in Moldova's financial sector over the last few years. Between 2014 and 2017, account ownership more than doubled (from 18 percent in 2014 to 44 percent in 2017), while the percentage of individuals that made digital payments quadrupled (from 8 percent in 2014 to 30 percent in 2017). Moldova is among a few countries with a slightly inverted gender gap, with more women having access to accounts than men. One reason may be that more women have stable public service jobs (for example in schools and social services) and use bank accounts to receive their salaries.[314]

The increase shown by the Findex data was driven by key structural reforms in Moldova's banking sector, which were first implemented in 2017 with close oversight from the International Monetary Fund (IMF).[XXIII] These reforms aimed at stabilizing the banking sector and imposed new shareholder transparency and management accountability rules.[315] They increased confidence in the economy, which after years of fraud led to the dramatic collapse of the banking sector.[316] In late 2014, an estimated USD1 billion was stolen from the assets of three large banks in Moldova, leading to their liquidation. The total loss from this theft was equivalent to 12 percent of Moldova's GDP.[317] Despite recent growth in the financial sector, Moldova continues to lag behind many neighboring countries in key financial inclusion metrics.

XXIII In 2016, a new parliamentary majority was established which adopted and implemented necessary reforms in the banking sector at the request of the IMF and the EU. Prior to 2016, four consecutive governments with no parliamentary majority were able to cooperate and follow a program advised by international financial institutions. "Moldova: Back From The Brink, And Getting Better". IMF. Accessed February 18, 2022. https://www.imf.org/en/News/Articles/2017/09/05/na090617-moldova-back-from-the-brink-and-getting-better

BARRIERS TO THE UPTAKE AND USE OF DFS

Interviews with FinTechs revealed that many Moldovans continue to distrust the financial sector, mainly due to the collapse of the banking sector. Such distrust affects the uptake of financial products and services, including digital financial services (DFS).

According to interviewees, some Moldovans may resist DFS because they do not want their financial transactions to be visible because they want to avoid taxation.[318] Lower income earners avoid commercial banks and instead choose to bank with microfinance institutions, or to keep their cash at home. Additional research is needed to identify other barriers to uptake and usage faced by clients, especially those living in remote and rural areas.

NO DEDICATED UNIT FOR FINANCIAL INCLUSION

The NBM, the independent regulatory entity which provides oversight to the financial sector, has neither a dedicated financial inclusion unit nor a strategy to improve outcomes in this area. In 2021, a financial literacy department was set up by the NBM. There are plans to undertake national research on financial literacy and develop a strategy to improve outcomes in this area. The OECD supports research and strategy planning, and the OECD toolkit for measuring financial literacy will be used to guide this process. The toolkit will help to identify target groups, prioritize initiatives, and establish Moldovan benchmarks compared to other countries with similar characteristics.

The financial literacy department will be supported by a working group of government representatives from several government departments including the Ministries of Finance, Education, and Economy. Several think tanks will also support this process.[319] DFS as a thematic area will be included into the national literacy agenda. Online payments will be promoted, and Moldovans will be educated on how best to protect themselves against online fraud.

MPAY, A GOVERNMENT SUCCESS STORY

In 2013, the E-Government Agency (E-gov) introduced a digital payment system called MPay. The service enables person-to-government payments such as taxes, administrative fines, and public services. It also facilitates 23 different types of government to person (G2P) benefits including COVID relief, pensions, and parental payments. Since its inception, MPay has processed 20 million transactions, with a total value of 20 billion Leu.[320]

MPay has partnerships with most of the major financial institutions across Moldova, including commercial banks and postal operators. It has formed partnerships with e-money provider PayMaster, and is in the process of finalizing partnership agreements with two other FinTech providers. This expansive partnership network offers citizens choices regarding how they prefer to receive government benefits and pay for government services.

Moldovans can use their bank accounts or e-money wallets. Those without access to a formal account can use cash at the post office. This choice-based model can provide a powerful opening for financial inclusion, especially for rural recipients who continue to receive their payments in cash at postal offices.

IN MOLDOVA, BIG BANKS RULE

Commercial banks are the dominant financial institution in Moldova and represent a total of 90 percent of total financial system assets. Two of the largest commercial banks hold more than half of all deposits and assets.[321] There is a lack of strong data on the penetration of these banks across the country, but all major commercial banks have a branch presence in urban areas, especially in the capital city, Chisinau, and limited presence in the regions. ATM infrastructure

of commercial banks is highly concentrated in urban areas, so most rural Moldovans are not effectively being served by the formal financial sector.[322]

Commercial banks are undergoing a rapid digitalization process, with aims to reduce their operating costs. On the retail banking side, commercial banks are moving their existing clients to their online banking platforms and starting to reduce their physical branch presence, especially in rural areas and remote administrative centers. Banks are also digitizing their existing suite of financial services, allowing their existing client base to transact digitally.

THERE ARE LIMITED OPTIONS FOR LOW VALUE DEPOSIT ACCOUNTS

In Moldova, there are limited options for low value deposit accounts that target low-income populations in hard to reach areas. There are also no transaction accounts tailored to clients who need lower value transactions, quicker turnaround of applications, and fewer document requirements for registration and transaction on these accounts. Account opening is cumbersome and requires significant paperwork and in-person identification of the client to comply with due diligence requirements for AML/CFT purposes, irrespective of the risk profile of the client.[323] Electronic Know Your Customer legislation is pending and is expected to be passed in 2022.

CARDS DOMINATE THE PAYMENTS SPACE

Credit cards are the most commonly used payment method in Moldova, and there are about 1.27 cards for every adult.[324] In 2019, the NBM reported that 10.5 million cashless payments were made in Moldova, with most (70 percent) made through a debit or credit card, and the balance made through other forms of digital accounts including e-money.[325] Cards are also commonly used for e-commerce transactions, but high interchange fees and other commissions discourage many local merchants from engaging in e-commerce and collecting payments digitally.

E-MONEY, A NASCENT PAYMENTS INSTRUMENT

Interviews with e-money providers revealed that e-money in Moldova is starting to grow, but that this payment instrument only processes a fraction of the overall digital payments in the country. There is a lack of data to characterize the size, and rate of growth, of e-money accounts and transaction volumes. FinTechs offering e-money solutions noted rapid growth. For example, Qiwi has more than 50,000 registered users across Moldova and more than 900 kiosks where clients can cash in and convert physical money into e-money.[326] They are in the process of expanding to rural areas, where they have had limited presence. It is unclear how many of these customers or kiosks are active, or the volume of payments that are processed through Qiwi and similar companies.

LIMITED COMPETITION IN THE E-MONEY SPACE

There is heavy commercial bank presence and limited competition from FinTechs in the digital payments space. Only four Moldovan FinTechs have successfully secured e-money licenses: Paynet, BPay, Qiwi, and Paymaster.[327] Entry into this area is impeded by significant administrative and financial barriers. For example, when applying for an e-money license, providers must have a balance of at least 300,000 Euros in their bank account.[328] Given the aforementioned barrier to obtaining external capital from investors, many companies cannot meet this high balance requirement, and choose to forgo an e-money license. Such barriers to entry limit competition in DFS, making the economy heavily dependent on card-based digital transactions.

THE FINTECH GAP

The FinTech market is underdeveloped in Moldova. However, some key areas have started to build traction such as payments and digital credit. There is a severe deficit in areas such as insurance and savings.

FinTechs face several barriers to growth and failure rates are high. Access to capital is a major challenge as with other technology startups. Lack of regulation is also a barrier. The NBM has not set up any regulatory sandboxes where new innovations can be tested in a safe and effective manner. A lack of legal clarity in key areas such as open banking and remote Know Your Customer (KYC) processes hinders FinTechs from experimenting with new models. Draft laws on electronic KYC and Payment Services Directive 2 are being prepared and reviewed, and are expected to pass in 2022.

KEY TERMS | BOX 7. Regulatory sandbox explained

A **regulatory sandbox** is a framework put in place by the regulator that lets financial entities experiment with innovative products, services, and business models in a controlled environment with targeted regulatory and supervisory policies. A sandbox can be seen as a signal to innovators in the financial sector that regulators are willing to engage.

There is currently no dedicated association to support FinTechs in Moldova, and there are not enough FinTechs in the market to warrant a dedicated association. Existing FinTechs receive ample support from broader industry associations such as the Moldova Association of ICT Companies (ATIC), the American Chamber of Commerce (AmCham), and Tekwill. These organizations foster dialogue between the government and FinTechs, providing FinTechs with legal clarity and the NBM with critical feedback from innovators in the financial sector.

ANTI-MONEY LAUNDERING (AML)

USD $1 billion was stolen from Moldova's largest bank in 2014, a coordinated effort involving three of Moldova's largest banks. Orchestrated by a local businessman, the maximum amount of loan finance was extracted from these banks, and transferred to shell companies in the UK and Hong Kong before being deposited into Latvian bank accounts.[329] This fraud triggered a number of structural reforms to the banking system, including those focusing on improving systems and policies for anti-money laundering, countering the financing of terrorism (AML/CFT), and increasing transparency in this area. A new AML/CFT law was introduced in 2017, which identifies measures, authorities, and procedures for detecting and preventing money laundering and the financing of terrorism. [330] New software is being developed with the support of the USAID/Moldova Financial Sector Transparency Activity (FSTA) program to support the NBM in detecting irregular activity in the market and responding swiftly and appropriately. This software will provide the NBM with a holistic view of AML threats and breaches, drawing data from the national payments system, commercial bank reports, and other government agencies. Training is being provided to commercial banks by FSTA to develop more effective AML tools and processes.[331] FSTA project representatives noted that in order to effectively and comprehensively implement AML tools and processes, the country must increase the number of local experts in this area.[332]

Some interviewees shared concerns that the existing AML regime is too stringent and is hindering development in other areas, specifically financial inclusion and e-commerce.[333] According to a USAID report, the AML agency threatens prosecution if a person is not systematically and physically identified during onboarding. This affects KYC processes for both banks and non-banks and onboarding for e-commerce platforms. This outdated policy is well recognized and development partners including USAID/Moldova are exploring how best to address this issue.[334]

REMITTANCES, A HEAVY INFLOW

The Moldovan population—especially its most vulnerable and financially excluded citizens—is highly dependent on remittances. Remittances account for 16 percent of GDP, putting Moldova in the top 20 of the most remittance-dependent countries in the world.[335] Forty-three percent of Moldovans receive remittances informally, either directly from a family member or friend, or through bus drivers who carry cash into the country on behalf of a relative.[336] Informal channels are used by lower income Moldovans, as the cost of transferring remittances through formal channels such as banks can be high because domestic and international intermediaries are involved in the process.[337] The COVID-19 pandemic increased remittance flows through formal channels, as lockdown and travel restrictions restricted the physical movement of cash across the country. [338]Several development partners, such as the World Bank, IOM, and UNDP, are working with the government to support the digitization of remittances and replace the substantial use of informal transfer channels, and to drive financial inclusion in rural areas.[339]

CYBERSECURITY IN THE FINANCIAL SECTOR

Early stage FinTechs in Moldova are especially vulnerable to cyber attacks and data breaches. Due to capital constraints, many use pirated software rather than purchasing licenses, which puts them at risk.[340] FinTechs interviewed do not have cyber insurance coverage to offset costs accrued when systems are breached or hacked. This indicates a lack of both preventive and responsive measures to guard FinTechs against the financial consequences of cyber attacks.

Banks in Moldova have invested heavily in policies, processes, and systems required to protect against cyber attacks. According to a representative from MAIB, this is because cyber attacks on Moldovan banks are common, and fraud management systems must be in place to prevent them. Financial institutions in Moldova are mandated by the regulator, the NBM, to have cybersecurity systems and processes in place. The NBM has a dedicated unit to evaluate these cybersecurity systems to ensure that they are in line with international standards and best practices. Establishing cyber policies and practices is increasingly important as the threat of cyber attacks from Russia could continue given the war in Ukraine and as cyber criminals and the cyber weapons they use become more sophisticated.[341]

THE CRYPTOCURRENCY GAP

There is no legal framework governing digital assets and cryptocurrencies in Moldova at present. The NBM has published several messages on its official website warning citizens about the risks that arise from the use of digital assets—cryptocurrencies in particular.[342] The NBM identified several risks related to cryptocurrencies, including the threat to the integrity of the financial system, including money laundering and financing of terrorism, financial crimes, and the use of virtual money to sell prohibited products. Individual risks were also identified for Moldovan consumers, including fraud when executing conversion operations, high commissions, fraud with electronic wallets, and personal data loss.[343] Despite NBM's warnings,[344] informal activities in this area (e.g., cryptocurrency exchanges) are high in Moldova, and receive little oversight given the lack of regulation in this area.[345]

2.3.4 ROOM TO GROW IN E-COMMERCE

SLOW GROWTH IN THE E-COMMERCE MARKET

The growth of e-commerce in Moldova has been slow, and at times has stagnated. The exact pace of growth, as well as the size of the market, is difficult to measure and track, given the absence of data in this area. Interviews revealed that the volume of sales on e-commerce platforms is low and both buyers and sellers are slow to move online.

Several e-commerce platforms are operational in Moldova. Domestic companies include Totul.Online,[346] an online marketplace for agricultural products started by Moldovan commercial bank MAIB and Agrobizness.[347] A handful of international platforms sell in Moldova, including Ukrainian platform Rozetka, and Romanian online retailer Elefant. There are efforts to increase the share of local e-commerce platforms by organizations such as Tekwill and ODIMM. In 2020, Tekwill launched an initiative to offer co-financing to companies using technology to boost e-commerce in Moldova.

INTERNATIONAL E-COMMERCE RANKINGS

Moldova ranks 53 out of 152 countries on UNCTAD's B2C E-Commerce Index. This is behind neighboring markets including Bulgaria (46), Romania (45), and Ukraine (51).[348] One of the key indicators that negatively affects the rankings is related to financial inclusion. The UNCTAD index uses the Findex account ownership indicator, which as noted above is 44 percent in 2017 in Moldova. Low levels of financial inclusion affect both the client's ability to get online and purchase goods on e-commerce, and the seller's ability to collect payments digitally directly from the accounts of clients, which impedes the growth of the e-commerce sector in Moldova. A robust e-commerce market is a significant driver of use for financial services, especially DFS, and can increase financial inclusion across the country.

A COMMITTED GOVERNMENT FACING IMPLEMENTATION CHALLENGES IN E-COMMERCE

E-commerce is at the forefront of the government's agenda and is positioned as a key driver of economic growth. Several commitments released by government officials have made clear the need to develop this sector.[349] A vibrant e-commerce sector is also seen as critical to moving closer to EU integration, creating jobs, and increasing tax revenue for Moldova.

Local governments are integrating e-commerce into their economic development strategies. The City of Cahul has the mandate to leverage e-commerce to support the development of local priority sectors such as agriculture. USAID/Moldova's FTA is working with several city administrations to create clusters where goods and services can be aggregated and distributed on domestic and international e-commerce platforms. Key sectors of focus include light manufacturing, digital media, creative industries, and engineering.

THE LEGAL ENVIRONMENT

A legal framework for e-commerce is in place, but there is room for improvement in secondary legislation. Moldova was an early adopter of e-commerce legislation in 2004 with Law 284/2004, although its implementation has progressed slowly. Since then, multiple laws and regulations have been introduced, most of which have been recently updated or are being aligned with equivalent EU legislations. In November 2021, the government passed the first legislative package for digitization of the Moldovan economy.[350] Major objectives included improving digital commerce and customs procedures for exports, boosting postal and courier services and strengthening and attracting international e-commerce platforms. Measures from this package are being implemented by the government, with the support of development partners including USAID/Moldova and GIZ.

Due to the complex nature of e-commerce business models, many peripheral laws need to be revisited and revised. This includes consumer protection, tax legislation, physical infrastructure, and customs codes. USAID/Moldova projects like the FTA and the Economic Council to the PM track and support the harmonization of these laws to boost growth in e-commerce. [351]

Critical regulatory gaps around interchange fees and merchant charges hinder MSMEs from adopting and using e-commerce. The definition of e-commerce is ambiguous, which leads to misunderstandings and misapplication of some critical provisions that relate to the legal framework. For example, if a merchant sells online but also has a physical storefront, the online selling activity is not classified as e-commerce because of the physical presence.

THE DOMESTIC LOGISTICS CHALLENGE

The poor state of Moldova's physical infrastructure hinders e-commerce growth. Moldova ranks at the bottom (128 out of 137) of the World Economic Forum's Road Quality Index.[352] Fifty percent of its roads have been classified as poor or very poor by the World Bank.[353] Degradation of roads due to usual wear and tear and lack of regular maintenance is especially apparent in rural areas where budgets for maintenance are lower. Fiscal investment to improve roads has increased drastically over the past five years, and increases in investment are expected to continue. [354]

The quality and reach of logistics networks is directly linked to the state of infrastructure. Until improvements are made, there will be challenges moving physical goods across the country and allowing e-commerce platforms to reach rural areas where road conditions are poorest.

Moldova also has limited warehousing facilities to support the storage and movement of goods. Large e-commerce providers, most of them international, are not willing to invest in infrastructure improvements given the small size of the Moldovan market.[355] Warehousing infrastructure needs to be upgraded for e-commerce to grow and to reach rural areas of the country.

THE INTERNATIONAL LOGISTICS CHALLENGE

Moldova faces several challenges related to logistics infrastructure at border crossing points. Some key port highways are under construction, and long delays exist at the Romanian border. Railroad infrastructure is weak and limited in terms of its coverage, making it obsolete as an international mode of transport. Maritime traffic at key ports has difficulty accommodating large cargo ships, due to the depth of the Danube waterway, along with clearance challenges at the Ukrainian and Romanian borders. [356] Challenges with logistics result in increased costs to import goods for sale; these costs are usually passed on to the Moldovan consumer.

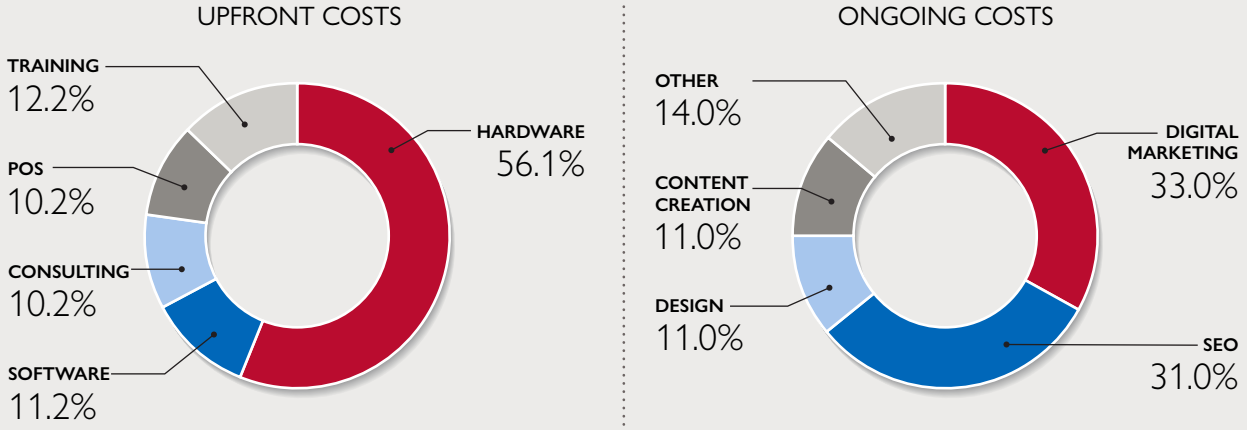
THE LACK OF ONLINE MERCHANTS

E-commerce is slow to take off due to a lack of merchants on the platforms, especially MSMEs. According to the ODIMM, fewer than 17 percent of MSMEs have incorporated digital technologies into their businesses; most of these MSMEs are located in urban areas.[357] Digitalization continues to be cost- prohibitive for many MSMEs because upfront and ongoing investments are required. Several MSMEs use working capital to cover such costs as it is often difficult for them to obtain a loan for digitalization activities because their business case is not always clear. It can take MSMEs several years to break even from their digitalization investments.[358]

BOX 13. The costs of doing digital business for MSMEs

MSMEs that plan to participate in e-commerce activities first need to digitalize their business operations. This requires several upfront costs to integrate technology into business operations as well as ongoing costs to promote and sustain online operations.

FIGURE 21. Breakdown of upfront and ongoing costs of doing digital business for MSMEs



Source: ODIMM. Interview with DECA Team, December 2021.

ODIMM partnered with FTA to pilot a program that provides grants and vouchers to MSMEs to cover some of the costs of digitalization. The pilot ran during the pandemic, and the health restrictions put in place to stop the spread of the virus underscored the criticality of integrating digital technologies into business operations. Up to 200,000 Leu (the equivalent of roughly $11,000 USD) was administered in grants to MSMEs. More than 120 companies benefited from this program.[359] As part of the pilot, ODIMM set up a credit guarantee fund to help MSMEs obtain bank loans to fund their digitization activities.[360] These grants cover costs like physical equipment, social media, and even cybersecurity. The program also helps MSMEs link into e-commerce platforms to increase their sales. Such programs are expected to continue and expand in 2022. Similar activities are in place, but much more is needed.

THE CHALLENGES OF STARTING AND CLOSING A BUSINESS

FTA is examining ways to address the broader barriers that make it challenging for MSMEs to operate effectively in Moldova.[361] Starting a new business can be done with ease, and the government has developed adequate procedures and policies to help merchants quickly and cost-effectively register their business so they can start selling their goods online. Closing down a business and resolving insolvency is more difficult. Such processes take Moldovan companies an average of nearly 3 years, higher than the regional average of 2.3 years.[362] Cumbersome paperwork and regulations enacted to protect debtors (which only prolonged insolvency) were key reasons for the long process. [363] Such barriers must be addressed to encourage more MSMEs to enter the digital commerce space, and make it cost effective to close down or pivot a business if needed.

MERCHANTS SELLING INTERNATIONALLY

The number of merchants that have digitized and are selling internationally on e-commerce platforms is limited. In 2020, only 654 Moldovan merchants opened seller accounts on the Chinese e-commerce company Alibaba. This is lower than the number of merchants in neighboring markets such as Romania (4,567) or Ukraine (4,551).[364] These countries have larger populations than Moldova—19 million in Romania and 44 million in Ukraine—compared to Moldova's 2.6 million.

Local merchants face numerous barriers when selling on international e-commerce platforms, accounting for the small number of sellers. Export processes are slow, burdensome, and expensive. Merchants face weeks of compliance delays and excessive export documentation. The cost of compliance has increased steadily over the past few years, and in proportion to revenues is highest for small merchants or MSMEs. [365]

On the import side, there are challenges for merchants that import goods to sell in the Moldovan market. Clearing customs is a time-consuming and expensive process. As a result, many merchants choose to circumvent customs and import goods informally by bus, mainly from the EU. The government, in partnership with development partners, is working to address these challenges. USAID/Moldova is working with the National Transportation Association to develop an E-Authorization System that allows registered transporters to cross the border with minimal intervention and delay.[366]

Moldova's exports cover only 47 percent of its imports, resulting in a trade deficit with most countries around the world.[367] To address this deficit, the government and donors in Moldova increasingly view cross border e-commerce as a significant opportunity to boost exports. Moldova's proximity to the EU, which has over 500 million customers and an annual growth rate of 25 percent for cross border sales, provides a significant opportunity for local merchants to expand their customer base.[368]

"MADE IN MOLDOVA" STIMULATING KEY SECTORAL GROWTH WITH E-COMMERCE

Under the High Value Agricultural Activity project, USAID/Moldova is positioning e-commerce as a critical enabler of growth in key value chains where the country has a comparative advantage.[369] This includes wine and agricultural products such as honey or berries. There are plans to use e-commerce to stimulate growth in emerging sectors that can drive economic development in the future, including tourism, light manufacturing, and the creative industries. Under the FTA project, the focus is on facilitating cross-border e-commerce, allowing merchants in key sectors to access regional and international markets to sell their products.[370]

THE HIGH COST OF DIGITAL PAYMENTS

The cost of collecting payments online discourages some businesses from selling online and is pushing others to accept only cash payments for online purchases. The average fee associated with an online payment is between 3 to 5 percent of the transaction. Many stakeholders interviewed noted that these fees were too high given the early stage of the e-commerce industry.[371] This cost is the result of interchange fees charged by large international credit card companies, such as Visa or Mastercard, as well as additional fees levied by Moldovan commercial banks. Given the nascency of the e-money space, merchants selling online have few options for digital payments, apart from cards. This means that there is no real incentive for commercial banks or their international card partner companies to lower such fees.

SECTION 3:
RECOMMENDATIONS

There are many ways the international development community and local partners can work together to strengthen Moldova's digital ecosystem. This section outlines a few ideas, providing recommendations for specific actions and partnerships, the list is organized by DECA pillar.

Table 3 below summarizes each recommendation as follows:

What: links to the recommendation details

Why: provides the motivation or intended impact of the recommendation

How: summarizes the approach actors in the international development community can use to implement the recommendation

The detailed recommendations section that follows provides further explanation of how to implement each recommendation including:

- Relevant context, recommended partners, and ways to build on existing efforts;
- Important considerations including unknowns and potential challenges; and
- Key opportunities to draw upon and align with the Principles for Digital Development and the SDGs.[XXIV]

XXIV These principles are nine living guidelines that provide best practices for every phase of the project life cycle. They were created in consultation with various international development organizations including USAID.

TABLE 3. Summary of DECA recommendations

	WHAT?	WHY?	HOW?
PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION			
1	Strengthen cybersecurity resilience by supporting the adoption of a whole-of-government approach	Safer and more resilient digital systems, and networks and more cyber aware and safe individuals ensure security, privacy, and long-term sustainability.	Partner with the GoM and donors that are active in the cybersecurity space to develop a framework for improving cybersecurity of critical infrastructure. Support the expansion of the cybersecurity talent pool by establishing centers of excellence. Enhance the effectiveness of the government CERT by supporting decentralization and capacity building.
2	Promote demand-based proof of concept initiatives in support of a safe, secure, and inclusive 5G rollout	Enhanced understanding of a right-sized rollout of 5G that ensures long-term sustainability for private and public sector actors.	Work with the Ministry of Infrastructure and ANRCETI to identify strategic entry points for international development actors during the current comprehensive infrastructure stocktaking exercise to ensure all public and private resources are accurately mapped in preparation for a productive and timely 5G rollout.
3	Enhance digital and media literacy through the development of baseline research and strategic partnerships	Increased digital inclusion and uptake of internet and digital tools and platforms, especially for marginalized and vulnerable populations.	Carry out a baseline study on digital literacy in partnership with the Ministry of Education and with EGA to serve as an input for the development of a national modular digital learning platform. Partner with actors including private sector corporate social responsibility and foundation-led projects.
PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE			
4	Build government capacity for data protection policy implementation and civil society capacity for holding the government accountable	Enhanced government capacity and motivation for ensuring data privacy and protection.	Monitor the evolving data protection legislative and regulatory reforms to then inform the creation of a more robust local talent pool of data protection trainers and experts within government. Support CSOs and academia to effectively monitor and raise awareness on data protection policy implementation.
5	Enhance local efforts for e-democracy through tailored trainings on the development of participatory digital tools	Increased transparency and participatory democracy.	Design and deliver training to CSOs and LPAs on collaborative approaches to developing e-democracy tools. Raise awareness with and incentivize innovators to create e-democracy solutions through the launch of a municipal digital innovation fund.
6	Strengthen local government capacity to integrate digital systems that increase transparency and data-driven decision making	Increased efficiency, quality, and effectiveness of local digitalized government systems, services, and processes.	Promote a standardized approach to LPA digitalization efforts and build on the MTender e-procurement system, supporting the full digitalization of LPA procurements. Work with the National Academy for Public Administration to develop and roll out digital literacy training and benchmarks for local government staff.

	WHAT?	WHY?	HOW?
7	Increase awareness of digital rights protection best practices in partnership with the Internet Governance Forum	Increased capacity of all Moldovans to safeguard against digital rights violations.	Partner with Moldova's Internet Governance Forum (IGF) initiative to develop a suite of awareness raising materials and platforms to counter potential and current digital rights violations including the spread of disinformation and the potential of censorship and surveillance.
8	Coordinate with other donors to expand digital government services with a focus on supporting SME growth	Expanded functionality, user-experience, and demand-centricity of digital government services.	Coordinate with other donor efforts to support implementation of the GoM digitalization agenda by digitalizing legal processes including for SME registration, enabling the expansion of MSign and MConnect at the local government levels, and integrating UX/UI design principles throughout the digitalization process.
	PILLAR 3: DIGITAL ECONOMY		
9	Use innovative approaches to build, attract, and retain technical talent	Enhanced supply of labor to ensure a growing, sustainable ICT sector.	Institute micro-credentialing programs to increase the digital talent pool, incentivize the Ukrainian refugee talent pool to remain in Moldova, and build on current efforts carried out by FTA to improve the quality of teaching staff. Focus on getting under-represented into technical work, including women, out of school youth, and refugees.
10	Strengthen the innovation ecosystem by attracting qualified talent and increasing the inflow of capital	Increased competitiveness of the ICT sector.	Support the extension of the foreign worker visa, attract regional IT companies that may be fleeing or have already fled Ukraine, Belarus, and Russia, attract and develop qualified founders, strengthen the mentorship network for new tech entrepreneurs, develop the local angel investor network, and be sure to integrate cybersecurity skillbuilding and awareness for new startups.
11	Expand the focus on financial inclusion, especially the digital kind, by supporting research, enabling FinTechs, and digitalizing remittances	Increased digital financial inclusion, promoting economic growth and household-level resilience to shocks.	Support landscaping research and data collection to fill a dire data gap on digital financial inclusion, enable innovation in digital financial service offerings by supporting promising FinTechs, support the development of a national strategy and unit on financial inclusion, leverage the potential of MPay, support increased digitalization of remittances, and focus on financial inclusion for Ukrainian refugees and potentially explore enabling cryptocurrency regulation.
12	Strengthen e-commerce infrastructure to support growth and integration, focus on rural market development	Improved trade and competitiveness and expanded markets for MSMEs.	Develop a strategy for e-commerce focused on rural and peri-urban growth, explore innovative solutions for logistics challenges, improve general digital payments infrastructure including minimizing associated costs and supporting E-KYC laws. support MSMEs to take advantage of the benefits of e-commerce for market expansion.

DETAILED RECOMMENDATIONS

1. STRENGTHEN CYBERSECURITY RESILIENCE BY SUPPORTING THE ADOPTION OF A WHOLE-OF-GOVERNMENT APPROACH

Given the increasing importance of cybersecurity and the gaps discussed in Pillar 1, it is important for the international development community to play a role in supporting Moldova's cybersecurity policy, capacity, and awareness. Cybersecurity can be seen as an enabler for the safe and secure integration of technology across all development programming. International development actors can consider working together to deploy a comprehensive, multi-track program on cybersecurity. The primary objective would be to effectively institutionalize a whole-of-society cybersecurity culture. Activities could focus on enhancing cybersecurity of critical infrastructure, supporting GoM updates to minimum cybersecurity requirements, building a more robust cybersecurity talent pool, institutionalizing CERTs across government units and levels, raising cybersecurity awareness, and leveraging private sector expertise.

> *This recommendation emphasizes the importance of cybersecurity in a way that draws from the Principles for Digital Development, "be collaborative" and "address privacy and security". This recommendation is most relevant to SDGs 12 (responsible consumption and production) and 11 (sustainable cities and communities).*

RELEVANT RESOURCES:

- Cybersecurity Hub (2022)
- ISO 27001 International Information Security Management Systems Standards (ISO, 2022)
- Cybersecurity Primer (USAID 2021)
- Operational framework and guidelines for the planning and execution of ITU regional cyber drills (ITU, 2021)
- Cybersecurity of the Republic of Moldova: a retrospective for the period 2015-2020 (Journal of Social Sciences, Turcano, et al, pg/ 74-83, 2021)
- Council of Europe CyberEast Project (Council of Europe, 2022)
- Information security strategy of the Republic of Moldova for 2019-2024 (Council of Europe, 2020)
- EU Cybersecurity Strategy (European Commission, 2020)
- Cyber Essentials Toolkits (Cybersecurity and Infrastructure Security Agency, 2020)
- How Estonia uses cyber hygiene as the cornerstone of cyber security (Invest in Estonia, 2018)
- Women in Cybersecurity - ISC2 Cybersecurity Workforce Report (ISC 2)

2. PROMOTE DEMAND BASED PROOF OF CONCEPT INITIATIVES IN SUPPORT OF A SAFE, SECURE, AND INCLUSIVE ROLLOUT OF 5G

The Ministry of Infrastructure and ANRCETI are discussing comprehensive infrastructure mapping which intends to draw synergies between physical and digital infrastructure assets such as visualized geographic locations, technical specifications and establishment of an updatable common database. The EU broadband mapping dashboard, which filters information and data by different types of users (public and experts) could be used as a reference.[372] While several different models on digital infrastructure mapping exist, it essentially refers to the mapping of public and private digital infrastructure assets that include everything from the fiber backbone, broadband and mobile telecom and digital communication suites including apps, data centers and networks, enterprise portals, platforms, systems, and software, cloud services and software, operational security, user identity and data encryption, APIs, and integrations. There is opportunity for the international development community to help ensure the infrastructure mapping exercise includes

consideration for last-mile connectivity and that all relevant parties have a seat at the table when decisions are made. Key government counterparts include the Ministry of Infrastructure and ANRCETI.

> *This recommendation is aligned with the Principles for Digital Development, "be collaborative" and "address privacy and security" and supports the achievement of SDG 17 (partnerships for the goals).*

RELEVANT RESOURCES:

- Study: Preliminary assessment of 5G networks & the impact on operators in the EU and EEA
- ITU (2021) 5G Country Profile: republic of Moldova (European Commission, 2021)
- Securing implementation of 5G in the Republic of Moldova (ITU, 2020)

3. ENHANCE DIGITAL LITERACY AND INCLUSION INITIATIVES THROUGH THE DEVELOPMENT OF BASELINE RESEARCH AND STRATEGIC PARTNERSHIPS

Digital literacy with a focus on inclusion is critically important for ensuring inclusive citizen engagement online and with digital government services. International development actors can ensure a more broad-based approach to digital literacy capacity building by facilitating multi-stakeholder dialogues regarding the alignment of last-mile connectivity solutions and digital literacy programming and work together to carry out a baseline study on digital literacy based on the EU DigComp Framework to identify skill gaps and specific upskilling needs across different segments of the population. There may also be opportunity to collaborate with private sector foundations and their corporate social responsibility programs to implement digital literacy initiatives.

> *This recommendation embodies the Principles for Digital Development, "be collaborative" and "build for sustainability" and is aligned with SDG 10 (reduced inequalities).*

RELEVANT RESOURCES:

- Digital Literacy Primer (USAID, 2022)
- EU DigComp Framework (European Commission, 2022)
- Digital talent for a transformative public sector culture (OECD, 2022)
- What we know about the gender digital divide for girls: A literature review (UNICEF, 2021)
- Digital Inclusion of Youth (ITU, 2021)
- The private sector is taking the lead on enabling digital inclusion. Here's how. (WEF, 2021)
- 5 ways digital working can help young people with disabilities into digital jobs (WEF, 2021)
- The Last Mile Solutions Connectivity Guide (ITU 2020)
- BATI Online Audience Study (BATI 2020)
- Connect 2030 - An agenda to connect all to a better world (ITU, 2020)
- A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 (UNESCO 2018)

4. BOLSTER GOVERNMENT CAPACITY FOR DATA PROTECTION POLICY IMPLEMENTATION AND CIVIL SOCIETY CAPACITY FOR HOLDING THE GOVERNMENT ACCOUNTABLE

Boosting the government's cybersecurity and data protection capacities are mutually reinforcing objectives that can be supported by the international development community. There is an opportunity to support the government to ensure a systemic, whole of government and whole of society approach to data protection and cybersecurity. Options for intervention include monitoring of the GoM's progress on harmonization with GDPR, building a more robust local talent pool of data protection experts and trainers, upskilling staff at all levels of government in data protection best practices, and supporting CSOs to monitor and raise awareness on data protection policy implementation.

> *This recommendation outlines plans for more robust data protection in alignment with the Principles for Digital Development, "be collaborative", "build for sustainability", and "understand the existing ecosystem. It is well-aligned with SDG and is aligned with SDG 17 (partnerships for the goals).*

RELEVANT RESOURCES

- EU GDPR Checklist for Data Controllers
- Sergiu Bozianu: Moldova Still Doesn't 'Get' Privacy Law (Balkan Insight, 2020)
- Legal statute for National Center for Personal Data Protection
- Privacy Research Association - Moldova

5. ENHANCE LOCAL EFFORTS FOR E-DEMOCRACY THROUGH TAILORED TRAININGS ON THE DEVELOPMENT OF PARTICIPATORY DIGITAL TOOLS

International development actors can support local ecosystems that enable participatory democracy using a blend of offline and online tools. This component can be integrated into and can build on existing programming that focuses on participatory government. There is opportunity for a wider range of e-democracy tools to be used including open data visualization, preference setting, polling and online voting, and increased use of interactive online tools. The underlying theory of change for this recommendation is that by introducing and incentivizing key local stakeholders to understand, own, and blend online and offline participatory tools, over time e-democracy tools will become institutionalized within LPAs. While this can be planned in the short-term, the trainings will have to be tested, refined, and reach a critical mass of participants before the Municipal Digital Innovation Fund might reveal truly useful and sustainable solutions.

> *This recommendation is designed in the spirit of the Principles for Digital Development "build for sustainability" and "understand the existing ecosystem. The recommendation supports SDG 16 (peace, justice, and strong institutions).*

RELEVANT RESOURCES

- EU Citizen-Science Platform: Projects, Resources, Tools, Training
- A Guide for Practitioners in Civic Tech: Tech for Development (MIT Gov. Lab, 2021)
- The GSMA Innovation Fund for Digital Urban Services
- SocialBoost: Ukraine *(civic tech NGO working with LG and civil society)*
- Urban Living Labs: Netherlands
- Ushahidi: Kenya (Crowdsourcing Solution to empower communities)
- I Change My City: India

6. STRENGTHEN LOCAL GOVERNMENT CAPACITY TO INTEGRATE DIGITAL SYSTEMS THAT INCREASE TRANSPARENCY AND DATA-DRIVEN DECISION MAKING

There is potential for digital technology to be integrated into government systems in a way that supports the government to improve transparency and data-driven decision making. The international development community can work directly with local government actors to ensure sufficient capacity to carry out government-wide digitalization efforts. Efforts can include supporting EGA's rollout of national CUPS and E-LPA. Support can also be provided to EGA to develop a minimum technological and visual standard for all LPA websites. Given the success of the existing MTender e-procurement system, activities can also focus on enhancing processes and procedures at the local government level. International development actors can also initiate capacity building programs for local governments to better use data, including GIS data, for data-driven decision making and urban planning. To ensure efforts garner sufficient uptake, digital literacy training for local government staff can be integrated to any of these efforts and can be designed in alignment with the EU DigComp 2.0 framework.

> *This recommendation embodies the Principles for Digital Development "be collaborative", "build for sustainability", and "understand the existing ecosystem". The recommendation supports SDG 16 (peace, justice, and strong institutions).*

RELEVANT RESOURCES

- Innovation and digital technology to re-imagine Participatory Budgeting as a tool for building social resilience (UN Habitat, 2021)
- Using Technology for Public Participation in Urban Regeneration (The World Bank)
- City Planning Labs: Indonesia (The World Bank)
- Public control of public procurement - Dozorro Solution, Ukraine

7. INCREASE AWARENESS OF DIGITAL RIGHTS PROTECTION BEST PRACTICES IN PARTNERSHIP WITH THE INTERNET GOVERNANCE FORUM

Russia's war on Ukraine may imply a heightened potential for digital rights violations in Moldova, whether through state-led censorship and surveillance or through the spread of disinformation, it is important that citizens, civil society, and the government are aware and preemptively protected. In partnership with Moldova's national Internet Governance Forum (IGF) initiative (MIGF), the National Academy for Public Administration,[373] and civil society organizations, the international development community can help to promote digital rights and internet freedom awareness including with regards to the right to privacy and freedom of expression per UN Human Rights Council, resolution 41/11.[374]

> *This recommendation is built on the Principles for DIgital Development "understand the existing ecosystem" and "be collaborative". The relevant SDGs are 16 (peace, justice, and strong institutions) and 17 (partnerships for the goals).*

RELEVANT RESOURCES

- Moldova Internet Governance Forum (MIGF)
- Disinformation Primer (USAID, 2021)

8. COORDINATE WITH OTHER DONORS TO EXPAND GOVERNMENT DIGITAL SERVICES WITH A FOCUS ON SUPPORTING SME GROWTH

The international development community can coordinate activities to support implementation of the government digitalization agenda with a focus on expanding sectoral government digital services. With the World Bank MGSP project coming to an end in 2023, there is opportunity to work with EGA to ensure implementation of the November 2021 legislative package on the digitization of the economy.[375, 376] Support efforts may include a focus on the digitalization of legal processes including procedures for SME registration, liquidation, and e-invoicing. There may also be opportunity to help enable the expansion of MSign to be connected to a wider range of services that are of high utility for target SMEs. Activities can also work to expand demand-based local digital government service offerings through the use of MConnect. Noting that it is important to ensure government platforms are interoperable at all levels of government, which could be facilitated by government-to-government API adoption. All actors should be sure to emphasize the importance of user experience/user interface (UX/UI) design by default for digital government services to ensure uptake by government staff and by citizen and organization users.

> *This recommendation aligns with the Principles for Digital Development "build for sustainability" and "understand the existing ecosystem". The recommendation supports SDG 8 (decent work and economic growth) SDG 16 (peace, justice, and strong institutions).*

RELEVANT RESOURCES

- The Digital Transformation of SMEs (OECD 2021)
- The EU Digital Services Act: Ensuring a safe and accountable online environment (The EU Commission, 2020)
- Digital Government: Minding the Empathy Gap (The World Bank, 2020)
- White Paper: Accelerating the Impact of Industrial IoT in Small and Medium-Sized Enterprises: A Protocol for Action (WEF, 2020)
- Opportunities through Technologies and Innovation in Moldova (OPTIM Project) (SIDA, 2020)

9. USE INNOVATIVE APPROACHES TO BUILD, ATTRACT, AND RETAIN TECHNICAL TALENT

Over the next decade, it is expected that outward migration trends will continue, and technically skilled talent will be increasingly pulled into the EU and North American markets, where demand for such talent is exploding. Initiatives should be geared at attracting and retaining technical talent in Moldova, and improving productivity in high skilled technical occupations. This will accelerate the growth of the ICT sector and digitalization of the economy. International development actors can consider programming and partnerships that increase the digital talent pool, one option for which could be through leveraging the recently increased refugee community and providing support services to make their transition easier and likelihood of remaining in Moldova higher. An important element of boosting Moldova's digital talent pool is improving the quality of teaching staff. The international development community could play a role in providing technical training and upskilling for teachers in the technology and innovation sectors.

> *This recommendation embodies the Principles for Digital Development, "understand the existing ecosystem" and "build for sustainability". This recommendation is most relevant to SDGs 4 (quality education), 8 (decent work and economic growth), and 10 (reduced inequalities).*

RELEVANT RESOURCES:

- The emergence of alternative credentials (OECD, 2022)
- Andela: Africa's AWS for Talent (Harvard Business School, 2021)
- Is there a policy remedy for brain drain in Europe? (The World Bank, 2019)
- A European approach to micro-credentials (European Commission)

10. STRENGTHEN THE TECHNOLOGY INNOVATION ECOSYSTEM BY ATTRACTING QUALIFIED TALENT AND INCREASING THE INFLOW OF CAPITAL

The international development community, including USAID/Moldova, has been a strong supporter of the innovation ecosystem, and should continue its work and focus in this area. Partners such as Tekwill, Startup Moldova, FTA and the IT Park as well as AmCham and other local business associations are well-positioned to have an impact in this area. Continued programming could include supporting the extension of the foreign worker visa, attracting regional IT companies to formally relocate to Moldova, and attracting and supporting qualified tech startup founders. A key element of helping tech startups to survive, sustain, and scale is mentorship and funding. The international development community can focus on connecting tech startups to a stronger mentorship network and to a reliable funding source such as a more developed local angel network or foreign venture capitalists. Across all of these efforts it is important to integrate standardized cybersecurity training and awareness building.

> *This recommendation is aligned with the Principles for Digital Development, "understand the existing ecosystem", "be collaborative, and "build for sustainability". This recommendation can support SDG 8 (decent work and economic growth), SDG 9 (industry, innovation, and infrastructure) and SDG 0 (reduced inequalities).*

RELEVANT RESOURCES:

- Cybersecurity is too big a job for governments or business to handle alone (WEF 2021)
- The importance of founder-market fit & how to highlight it while fundraising (Forbes, 2020)
- Investing in founder-market fit (Tom Wilson, 2020)
- Best practices in creating a venture capital ecosystem (IDB, 2020)
- MarketLinks Finance Wiki
- Mobilizing Private Finance for Development (USAID, 2019)

11. EXPAND THE FOCUS ON FINANCIAL INCLUSION, ESPECIALLY THE DIGITAL KIND, BY SUPPORTING RESEARCH, ENABLING FINTECHS, AND DIGITALIZING REMITTANCES

Financial inclusion is a critical enabler of the digital economy more broadly, and e-commerce more specifically. Not having a focused and well resourced financial inclusion agenda could impede efforts in these areas. The international development community could carry out efforts that help the government understand key issues around financial inclusion, link financial inclusion work to the broader digital transformation efforts and digital economy agendas, develop a clear strategy in this area, and build capacity to execute this strategy within, and across, government. There is also opportunity to stimulate innovation and incentivize startups to develop solutions that address key financial inclusion challenges. Specific actions may include supporting landscaping research efforts regarding Moldova's financial inclusion metrics, which can be done in partnership with NBM. The international development community can also de-risk innovation in the financial inclusion space by providing funding and support services for FinTech startups. There may

also be opportunity to work with the NBM to develop and implement a comprehensive national financial inclusion strategy. Other important areas with opportunities for intervention include leveraging MPay and digitalizing remittances as entry points for digital financial inclusion. With increased refugees passing through or settline in Moldova, some of whom are using cryptocurrency as a way to access funds, there may be opportunity for the international development comunity to focus on financial inclusion for refugees and ensure adequate consumer protections are in place amidst a rise of cryptocurrency activity in Moldova.[377]

> *This recommendation was designed with the following Principles for Digital Development and SDGs in mind: Principles for Digital Development, "understand the existing ecosystem", "build for sustainability", and "be collaborative"; SDGs 8 (decent work and economic growth) and 10 (reduced inequalities).*

RELEVANT RESOURCES:

- Digital Payments Toolkit (USAID, 2020)
- Digital financial inclusion (World Bank)
- Enabling financial inclusion through e-commerce (BWTP, 2020)
- G2Px: Digitizing government to person payments (World Bank)
- From ownership to usage: empowering G2P beneficiaries through a better account engagement solution (Women's World Banking, 2021)
- How to create and sustain financial inclusion (BCG, 2017)
- Refugee and identity (GSMA, 2017)

12. STRENGTHEN E-COMMERCE INFRASTRUCTURE TO SUPPORT GROWTH AND INTEGRATION, FOCUS ON RURAL MARKET DEVELOPMENT

To support the sustainable economic growth of Moldova, it is critical that the country have an expansive and robust e-commerce infrastructure that can open up new markets for MSMEs, create new jobs, and expand opportunities for regional and international trade. But before Moldova realizes the full benefits of e-commerce, attention must be paid to improving logistics and the digital payments infrastructure, developing a clear strategy for improving e-commerce growth in rural areas, and supporting MSMEs to safely realize the full benefits of e-commerce platforms. This will likely require a collaborative effort between a wide range of stakeholders, including the government and other development partners supporting this area. The Alliance for eTrade Development is an effective source of information on all of these important topics, and international development actors can participate in the Alliance's quarterly meetings to derive lessons from other efforts undertaken by development partners to scale e-commerce and use it as a mechanism to strengthen rural market development.[378] Areas for intervention include developing a clear strategy for e-commerce with a focus on rural and regional growth and exploring innovative solutions for improved logistics and digital payments infrastructure. The international development community can also support MSMEs to reap the full benefits of e-commerce by digitalizing their operations and linking into e-commerce platforms.

> *This recommendation is aligned with the Principles for Digital Development "understand the ecosystem" and "design with the user". It can support SDGs 8 (decent work and economic growth) and 9 (industry, innovation and infrastructure).*

RELEVANT RESOURCES:

- Digital security in SMEs (OECD, 2021)
- Securing SMEs, what's next? (McKinsey, 2021)
- Best practices on supporting SMEs on digital transformation (SME United)
- What the World can Learn from Rwanda's Approach to Drones (WEF, 2019)
- Facilitating trade and logistics for e-commerce (World Bank, 2019)
- Rural Taobao: Alibaba's Expansion into Rural E-Commerce (Harvard Business School 2019)
- The role of transport and logistics in promoting e-commerce in developing countries (UNCTAD, 2018)
- Delivering the goods, e-commerce logistics transformation (WEF, 2018)
- EU-Republic of Moldova Association Agenda (European Commission, 2017)
- Alliance for eTrade Development (USAID and Alliance for eTrade)

APPENDICES

A. RECENT CYBERSECURITY LAWS, REGULATIONS, AND POLICIES

Overview of laws, policies, and regulations on cybersecurity:

- Government Decree No. 482 of August 7, 2020 the Measures necessary to ensure cyber security at the government level13 amended Resolution No. 414/2018 and designated the Information Technology and Cyber Security Service as the Governmental Center for Response on Cybersecurity Incidents.
- Concept of Information Security of the Republic of Moldova (Law No. 299, 2017) and Information Security Strategy and Action Plan (2019-2024) focus on four pillars ensuring: 1) security of the cyber information space and investigating cybercrime; 2) security of the media information space; 3) strengthening of operational capabilities; 4) efficiency of internal coordination and international cooperation in information security.[379]
- National Cyber Security Programme (2016-2020) addressed eight areas: 1) secure processing, storage, and access to data; 2) security and integrity of electronic communication networks secure processing; 3) storage and access to data; 4) security and integrity of e-communications networks and services; 5) capacities of the Prevention and Emergency response (CERT); 6) preventing and countering cybercrime; 7) strengthening of the cyber defense capabilities; 8)education and information; cooperation and international interaction. The program aligned with the National Strategy for Digital Moldova 2020, the National Security Strategy and the National Defense Strategy (2018-2021).[380]
- Government Decision 414/2018 on Consolidation of data centers in the public sector.[381]
- In 2018, GoM signed a multi-year Science for Peace and Security (SPS) Programme with NATO which aims to establish the Moldovan Armed Forces Cyber Incident Response Capability with a supporting cyber defense infrastructure.[382]
- GoM Decision No. 201/2017 on Minimal Cybersecurity requirements stipulates the creation of an implementation framework for Mandatory Minimum Cyber Security Requirements, a state policy on cybersecurity with a list of targeted information systems for the application of advanced security requirements.[383]
- GoM Decision No. 212 (2017) and Action Plan on the Promotion of Internet Safety of Children and Adolescents (2017-2020) lists protective measures and promotion of safer online environment for children and adolescents.[384]
- Law No. 20 on Prevention and Combating Cybercrime (2009, amended in 2013) aligns with the Budapest Convention on Cybercrime and defines competent bodies for combating cyber crime, along with responsibilities of service providers, and principles of international cooperation.[385]
- Law No. 1069 (2000; last amended in 2018) sets out rules and conditions of activity in the field of informatics, along with the rights and obligations of the state, individuals, and legal entities in the process of creation, management, use, and maintenance of information systems.[386]
- Government Decision No. 746 of 2010 On the approval of the updated Individual Partnership Action Plan between the Republic of Moldova and NATO.[387]
- Moldova is a member of the regional GUAM Working Group on Cyber Security[388] and of the Cybersecurity Alliance for Mutual Progress - CAMP Initiative,[389] a collaborative and experience sharing platform on cybersecurity.

B. DEFINITIONS

Definitions from USAID Digital Strategy 2020-2024 unless otherwise mentioned.

Cybersecurity: The prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and non-repudiation.

Cyber Hygiene: The practices and steps that users of computers and other devices take to maintain system health and improve online security. These practices are often part of a routine to ensure the safety of identity and other details that could be stolen or corrupted.[390]

Data Privacy: The right of an individual or group to maintain control over, and the confidentiality of, information about themselves, especially when that intrusion results from undue or illegal gathering and use of data about that individual or group.

Data Protection: The practice of ensuring the protection of data from unauthorized access, use, disclosure, disruption, modification, or destruction, to provide confidentiality, integrity, and availability.

Digital Divide: The distinction between those who have access to the Internet and can make use of digital communications services, and those who find themselves excluded from these services. Often, one can point to multiple and overlapping digital divides, which stem from inequities in access, literacy, cost, or the relevance of services. Factors such as high cost and limited infrastructure often exacerbate digital divides.

Digital Economy: The use of digital and Internet infrastructure by individuals, businesses, and government to interact with each other, engage in economic activity, and access both digital and non-digital goods and services. As the ecosystem supporting it matures, the digital economy might grow to encompass all sectors of the economy—a transformation driven by both the rise of new services and entrants, as well as backward linkages with the traditional, pre-digital economy. A diverse array of technologies and platforms facilitate activity in the digital economy; however, much activity relies in some measure on the Internet, mobile phones, digital data, and digital payments.

Digital Ecosystem: The stakeholders, systems, and enabling environment that together empower people and communities to use digital technology in order to gain access to services, engage with each other, or pursue economic opportunities. A digital ecosystem is conceptually similar to, but broader than, a digital economy. Although certain aspects of the digital ecosystem have country-wide reach, other features differ across geographies or communities. The critical pillars of a digital ecosystem include 1) sound enabling environment and policy commitment; 2) robust and resilient digital infrastructure; 3) capable digital service-providers and workforce (e.g., both public and private institutions); and 4) empowered end-users of digitally enabled services.

Digital Identity: The widely accepted Principles on Identification define identity as "a set of attributes that uniquely describes an individual or entity." Digital identification (ID) systems often require registering individuals onto a computerized database and providing certain credentials (e.g., identifying numbers, cards, digital certificates, etc.) as proof of identity. Government actors can set up these systems to create foundational, national ID programs, or donors or non-governmental organizations (NGOs) for functional purposes to identify beneficiaries, e.g., for humanitarian assistance and service-delivery.

Digital Literacy: The ability to "access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic and social life. This may include competencies that are variously referred to as computer literacy, information and communication technology (ICT) literacy, information literacy, and media literacy."

Gross National Income: The gross national income (GNI), previously known as gross national product (GNP), is the total domestic and foreign output claimed by residents of a country, consisting of gross domestic product (GDP), plus factor incomes earned by foreign residents, minus income earned in the domestic economy by nonresidents.[391]

C. METHODOLOGY

The Moldova DECA included three components:

1. **USAID/Moldova engagement:** USAID/Moldova designated one point of contact (POC) within the USAID/Moldova program office. The POC was responsible for leading communication with the DECA implementation team; helping identify stakeholders; reviewing relevant documents during planning, key informant interviews, and the analysis and report-writing stages; and attending selected interviews during the interview phase.

   The POC helped to organize the introduction and post-interview recommendation workshop with USAID/Moldova. These engagements were important to socialize the DECA purpose and preliminary findings across various USAID/Moldova technical offices.

   This engagement was important for ensuring an appropriate mix of interviewees and was critical to building the research team's understanding of USAID/Moldova's priorities.

2. **Desk research:** The desk research used a standardized template organized around three pillars (digital infrastructure, access and use; digital society and governance; digital economy). It included three components: 1) review of USAID/Moldova's CDCS, funding allocations, and digitally relevant programming; 2) quantitative analysis of open-source data and indices to produce regional comparisons (e.g., GSMA, World Economic Forum, International Telecommunication Union); and 3) internet research guided by high level questions under each pillar about the state of Moldova's digital ecosystem.

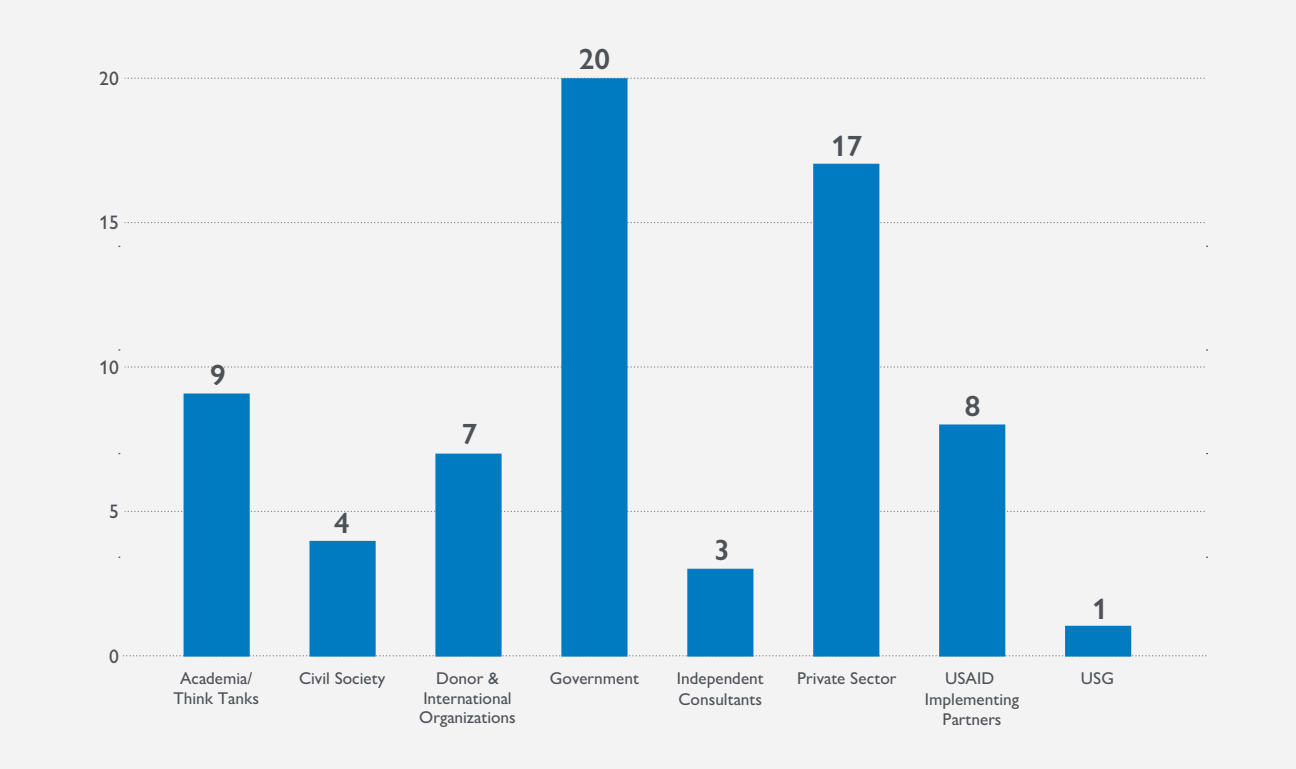
   Desk research was shared with USAID/Moldova before interviews and was used to inform the interview guide questionnaires.

3. **Interviews:** The research team collaborated with USAID/Moldova to compile a list of target stakeholders across civil society, academia, international organizations, the private and public sectors, and within USAID/Moldova. Initial key informant interviews were secured through the DECA team and USAID/Moldova networks. Additional interviewees were added throughout the research process through referrals from completed interviews.

   During the interview phase, the DECA team conducted four to eight interviews per day. Most interviews were attended by at least two team members, with a lead interviewer and a notetaker. To best triangulate findings and to test different interview styles, team members rotated between interviews. Each interviewee was asked a general set of questions which were developed prior to the interview phase and targeted to interviewees based on learnings from previous interviews.

   To ensure a diverse mix of key informants, the research team evaluated the list of scheduled interviews and conducted additional outreach in an attempt to fill identified gaps. The graph below and Appendix D shows the 68 interviews by sector (informed by 25 female interviewees, and 43 male interviewees).

FIGURE 22. Moldova DECA key informant interviews, by stakeholder type



Analysis

The bulk of analysis was conducted during the interview phase. Once per week during the eight weeks of interviews, the DECA research team conducted interview debriefs. These meetings ensured that all team members were briefed on each interview, and facilitated the triangulation of emerging themes that could then be tested in subsequent interviews. Midway through the interviews, the team identified primary themes based on these initial findings. Upon completing an interview, the team convened to revisit these themes, confirmed their validity against some interview notes, and organized findings around the three pillars outlined in this report (digital infrastructure and adoption; digital society, rights, and governance; and digital economy).

Limitations

The research team was limited, to an extent, by each member's technical expertise. DECA team members were chosen to provide coverage of key technical areas identified in a preliminary review, particularly around digital inclusion, digital government, cybersecurity, and digital finance. This may have introduced some bias—weighting the specializations of team members more heavily than areas such as digital infrastructure, digital rights, and digital trade.

A large number of key informants were selected through USAID/Moldova and DECA team networks, which may have excluded stakeholders who are less comfortable engaging with U.S. government representatives. All interviews took place virtually; as a result, information is limited to interviewees able to connect to virtual platforms. A large portion of interviewees were based in Chisinau, therefore information gathered is limited to their knowledge and work across the country.

Rather than rigorous qualitative methods (e.g., thematic coding), analysis of interview notes depended on triangulation of findings within the research team which attempted to balance thematic gaps by consulting technical experts and seeking additional interviewees.

Research team

The DECA team was composed of digital development experts with technical expertise in digital inclusion, digital government, cybersecurity, and digital financial services. Team members who were technical experts attended most interviews that related to their expertise. The team also included a local digital development expert with experience working with international donors and with the GoM.

D. KEY INFORMANTS

ACADEMIA/THINK TANKS	
1	Expert Group Think Tank
2	Institute for Development and Social Initiatives, (IDIS Viitorul)
3	National State University
4	Information Society Development Institute
5	Institute for Standardization of Moldova (ISM)
6	Institute for European Policies and Reforms
7	Technical University of Moldova
8	Academy of Science
9	Circle Engineering Cluster at the Technical University
CIVIL SOCIETY	
10	Watchdog.md
11	AmCham
12	Organization for the Development of Small and Medium Enterprises
13	National Association of IT and Communications Companies
INTERNATIONAL ORGANIZATION	
14	JICA Moldova
15	EU
16	GIZ
17	Swedish Embassy
18	UNDP
19	UNDP
20	World Bank
GOVERNMENT	
21	E-Government Agency
22	National Radio Frequency Management Service
23	CERT-GOV-MD
24	EGA
25	STISC

26	Ministry of Economy
27	National Agency for Regulation of Electronic Communications and Information (ANRCETI)
28	Ministry of Finance
29	Ministry of Infrastructure
30	Congress of Local Authorities of Moldova (CALM)
31	E-Government Agency
32	E-Government Agency
33	State Chancellery
34	Chisinau Municipality
35	National Center for Data Protection
36	National Integrity Authority
37	Ministry of Finance
38	Ministry of Education
39	City of Cahul
40	Electronic Governance Agency
INDEPENDENT CONSULTANTS	
41	Law, privacy and data protection services
42	Independent
43	Open Government Partnership
PRIVATE SECTOR	
44	Moldcell
45	Orange Moldova
46	STARNET
47	IT Park
48	Qiwi
49	Moldova Agroindbank
50	National Bank of Moldova
51	Moldova Business Angels
52	Startup City Cahul
53	Actech

54	Tekwill
55	QSystems
56	Anon FinTech
57	Salt Edge
58	Fintech Moldova
59	Fagura
60	AMCham
USAID IMPLEMENTING PARTNER	
61	IREX, My Community Project
62	M-Media Project, Internews Moldova
63	Data for Impact "D4I"
64	IREX, My Community Project
65	Nathan Associates
66	FSTA project
67	FTA project
68	US Embassy - Moldova

ENDNOTES

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